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# AVONLEA/OLD WOMEN'S: A STUDY OF CULTURE CHANGE ON THE NORTHERN PLAINS THROUGH THE ANALYSIS OF LITHIC AND CERAMIC ASSEMBLAGES

BY

CAROLINE ROSE HUDECEK

A THESIS
SUBMITTED TO THE FACULTY OF GRADUATE STUDIES AND RESEARCH
IN PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE DEGREE OF MASTER OF ARTS

DEPARTMENT OF ANTHROPOLOGY

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Date Aug 16, 1989

## ABSTRACT

Stylistic and temporal differences in projectile points have long been used by Plains archaeologists to establish chronologies of cultural complexes for the Northern Plains. However, this practice is often extended to using changes in projectile point types as indicators of culture change, the Avonlea and Old Women's Phases being an example of that practice. The assumption that one point type can be equated to one cultural group and that any change in that point type reflects a change in the cultural group can lead to problematic conclusions. A culture is represented by much more than a projectile point type. Instead, culture must be considered multivariate. Culture change cannot be based on a single variable such as projectile point type but rather on all aspects of culture represented in the archaeological record.

With regards to the culture changes between the Avonlea and Old Women's Phases of the Late Prehistoric Period on the Northwestern Plains, archaeological evidence of lithic and ceramic assemblages indicates a general continuity between the two phases rather than a distinct break. Examination of lithic utilization patterns suggests a heavy reliance during both phases on local lithic resources. During the Avonlea Phase, assemblages are dominated by local cherts, chalcedonies, and quartzites, with small amounts of petrified wood, exotic obsidian, Knife River Flint, and exotic cherts. Lithics from Old Women's Phase sites are similar: local cherts, and quartzites, with a definite increase in petrified wood use and small amounts of exotic obsidian, Knife River Flint, and exotic cherts. Lithic

assemblages and technologies also appear relatively similar between the two phases except for the increase in the bipolar technique for the production of pièces esquillées during the Old Women's Phase. It appears that Avonlea and Old Women's pottery represents a relatively continuous development with occasional stylistic changes in surface decoration.

Based on the evidence reviewed in this thesis, any differences from the Avonlea Phase to the Old Women's Phase should not be regarded as involving a major culture change but rather as a sequential transition with gradual stylistic variation in projectile points and ceramics.

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# CHAPTER ONE

# THE CONCEPT OF CULTURE CHANGE

## INTRODUCTION

Stylistic and temporal differences in projectile points have long been utilized by Plains archaeologists to differentiate specific cultural complexes and thus help establish a culture-historical framework for the Northern Plains area. However, archaeologists often extend this practice by using changes in projectile point types as indicators of culture change. The assumption that a point type can be equated to a specific cultural group and that any change in that point type, therefore, automatically reflects a change in the cultural group is common in Plains archaeology.

Unfortunately, this assumption can lead to erroneous and problematic conclusions. An archaeological culture is unlikely to be represented by a single projectile point type. Culture is not a univariate phenomenon which can be measured with a single variable. Rather, culture is a multivariate phenomenon and must be viewed as a system composed of many subsystems. A cultural system consists of environmental and sociocultural subsystems in which people, things, and places are all components. The

origin of cultural processes and change is in the dynamic articulation of these components and subsystems (Binford 1965). It follows that explanations of culture change cannot be based on a single variable, in this case projectile point type, but rather must be viewed from a multivariate perspective, taking into consideration all other aspects of culture that are represented in the archaeological record.

This problem of describing and explaining culture change from the archaeological record first came to my attention during the course of my work on a lithic collection from the Empress site (Hudecek 1988), a Late Prehistoric tipi ring site in southeastern Alberta. The Empress site has both Avonlea and Old Women's projectile point types in its assemblage and therefore has been cited as a "transition" site between the Avonlea and Old Women's Phases (Reeves 1977). Unfortunately, terms such as "transition", "culture change", and "phase" are often used by archaeologists without a clear understanding of their meaning. This practice has necessitated an examination of projectile point changes as evidence of culture change and the assumptions that Plains archaeologists make with regards to terms such as "transition", "phase", and "change".

The purpose of this thesis is to evaluate, critically, the basis for interpretations of culture change in the archaeological record that rely on

projectile point types, specifically between the Avonlea Phase and Old Women's Phase of the Late Prehistoric period on the Northern Plains of North America. I will concentrate on how change can be recognized in the archaeological record of the Northern Plains; that is, what criteria or boundaries are used in Northern Plains Prehistory to determine culture change, and to what extent does change in projectile points illustrate or represent culture change. Because information about paleoclimate, ecological relationships, and faunal resources is often problematic, these types of data will not be considered. Instead, this study will deal only with lithic and ceramic assemblages, for which we have abundant and reasonably complete information. Conclusions derived from this specific lithic and ceramic data set will be compared with those of other archaeologists who have worked with Avonlea and Old Women's assemblages.

Chapter 1 will deal with the concept of change in archaeological research. Evolutionary shifts, diffusion, independent invention, variability, typologies, and equating projectile point styles with cultural groups will be discussed. The archaeological evidence for the Late Prehistoric period of the Alberta and Saskatchewan Plains will be presented in Chapter 2. Lithic and ceramic assemblage data from several sites with Avonlea and Old Women's components will be examined and then compared in Chapter 3 to determine

whether there is evidence of a gradual shift or sharp break between the two phases. Discussion will focus upon projectile points, stone working technologies, tool types, lithic types and sources, and ceramic types. Chapter 4 will critically review the literature regarding the relationship between the Avonlea and Old Women's Phases. Conclusions concerning the identification and interpretation of culture change in the archaeologial record with specific reference to Plains prehistory will be presented in the final chapter. Limitations of this study, as well as recommendations for possible future research topics will be discussed. It is hoped that this study will provide a more coherent and sophisticated approach to analyzing change in Plains prehistory.

## CULTURE CHANGE

### INTRODUCTION

Culture change has been a much discussed and debated issue throughout the history of anthropology (cf., Trigger 1978, 1981; Willey and Sabloff 1980). The New Archaeology of the 1960s shifted the focus of

archaeology from chronologies, cultural-historical sequences, and descriptions of artifacts, to process: the explanation of culture change and variability observed in the archaeological record (Willey and Sabloff 1980:208). As a result of its new interpretive powers, archaeology is being employed as a means of analyzing the processes of culture change and adaptation through time, and is yielding more information about culture change than ever before (Trigger 1981:13; Wright 1977:1). Explanation of change, not description, should be the primary concern of archaeology (Plog 1974:9). Most of what we can ever hope to learn about the nature of social and culture change in prehistoric times must be elicited from archaeological data (Trigger 1981:10).

Numerous approaches and theories have been developed for explaining culture change in anthropological and archaeological contexts (cf., Bee 1974). Evolutionary approaches, first proposed by Marx, Engels, Spencer, Morgan and Tylor, and later rejuvenated by Leslie White, attempted to analyze changes through time, but often encountered problems when applying "universal" scientific laws and stages to all cultures. The historical particularist approach, while denying the existence of universal laws and concentrating on the collection and documentation of ethnographic data in restricted geographical areas, ignored the possible effects of diffusion and

culture contact. Although diffusion and acculturation approaches to studying change took into consideration the effects of culture contact and external stimuli, they failed to recognize internal processes of innovation and adaptation to the environment as possible mechanisms of change.

Functionalist approaches studied the interconnections and interrelationships between groups, components, and social structures, focusing on internal factors for explaining change, rather than external factors such as culture contact. Ecological approaches to the study of change emphasized environmental factors as mechanisms of change, viewing culture as an adaptive system. Many archaeologists have now turned to this concept of adaptation of the cultural system to its natural environment for the generation of hypotheses concerning the process of culture change (Willey and Sabloff 1980:261). Factors other than environmental are often ignored, however. Finally, psychocultural approaches focused on the behaviour of individuals, especially the process of innovation, as explanations for culture change. In this approach, it is often difficult to transfer processes operative at the individual level to the level of the cultural group.

Most often the theoretical approach one employs depends upon the questions being asked. In this study, I will use a combination of theoretical approaches. Culture will be viewed in an evolutionary perspective as an

adaptive system composed of various subsystems.

## THE CURRENT CONCEPT OF CHANGE IN PLAINS ARCHAEOLOGY

### Cultural Evolutionism and Diffusion

Alice Kehoe (1982) has argued that current models in American archaeology regarding cultural evolution and change contain 19th century notions of human progress, heavily influenced by Leslie White's unilineal cultural evolutionism. Leslie White (1949,1959) maintained that the universe was ordered, and lying beneath this order were discoverable universal laws. According to Kehoe, cultural evolutionism in contemporary North American archaeology accepts the following propositions:

> (1) human societies have changed over time in a non-random manner,
> (2) there has been a general trend among human societies toward the harnessing of ever greater amounts of energy in the service of human enterprises,
> (3) human societies have tended to progress from a simple small group labeled "band", through kin-based rank form labeled "chiefdom", to the complex form labeled "state". (1982:116)

Kehoe recommended that this cultural evolutionism be rejected, as the assumptions are unwarranted. Instead, archaeologists must recognize that

human societies are inherently complex, that societal evolution has been multi-directional, and that an increase in complexity, as assumed with the band, chiefdom, state progression, has not been a universal characteristic of evolution (Kehoe 1982:118-119; Simpson 1970:68-72). To Kehoe (1982), rather than using this concept of cultural evolutionism in archaeology, adaptation, a concept borrowed from modern evolutionary biology, better explains culture change.

> It would seem to be more propitious for archaeologists to examine modern evolutionary biology rather than cultural evolutionism in order to extrapolate useful models for looking at prehistoric culture change. (Kehoe 1982:119)

Contemporary evolutionary biology emphasizes adaptation rather than a unilineal progression. In doing so, it is limited to describing empirical phenomena and their apparent relationships, and to studying populations in their contexts and environments rather than studying types (Kehoe 1982:119).

While I agree with Kehoe, I would also emphasize the importance of the temporal framework in order to examine cultural changes and adaptations. Also, one must question whether all changes are the result of adaptation to

the environment, implying a need or function. Change may be voluntary rather than purposeful. Internal stimuli such as innovation may be important mechanisms for change. Attitudes, ideology, politics, and other sociocultural aspects influence human choices, selections, and responses; therefore, applying only biological models to explain cultural systems often leads to difficulties, as people are biological as well as culture-bearing organisms (Bennett 1976:199). This type of sociobiological or biological reductionism approach has been soundly criticized by Marvin Harris (1979:119-140).

Concepts of cultural evolutionism and culture change with specific reference to Plains Archaeology have been discussed by Michlovic (1986). He noted that many Plains archaeologists have accepted evidence which points to stability in the bison hunting adaptation, and therefore the apparent importance of diffusion as a mechanism for change on the Plains (Michlovic 1986:207). For example, Wedel (1977), Mulloy (1952), Willey (1966) and others have referred to the Plains peoples' dependence on bison and to the longevity of their traditional hunting pattern. Wedel believed that there had been a:

> ...Plains culture area for a very long time, an area whose boundaries and environmental characteristics have shifted from time to time, but with a central core of natural and cultural features that distinguish it from its

> surrounding areas and in which a functionally coherent way of life dominated....the Plains traits that have historical depth - the whole bison-hunting tradition - are more likely to be of very long standing in the region...(Wedel 1977:10)

Similarly, Michlovic stated that:

> ....Plains Archaeology reveals widespread continuity in the hunting-gathering lifestyle, from Paleo-Indian through Late Prehistoric times, with significant deviations attributable to the intrusion of social and technological innovations from the east or southwest (Michlovic 1986:210).

Frison (1978:19) has likewise argued that:

> ...the Paleo-Indian hunting group was about the same size and the same complexity as the terminal Late Prehistoric period hunting group and was doing about the same thing.

In addition, Reeves (1978:97) agreed that the dominant bison driving pattern of subsistence technology was stable for at least 6000 years. Stratified archaeological sequences from the Plains, Head-Smashed-In Buffalo Jump (Reeves 1978) for example, provide evidence documenting continuity in bison hunting for several thousand years. It is generally believed that despite changes in projectile point styles, the Plains lifestyle essentially did not change over time, and that "the general outline of Plains Prehistory

remains: bison hunting and the diffusion of culture traits" (Michlovic 1986:208).

Despite this consensus concerning the stability of the bison hunting adaptation on the plains, Michlovic (1986:208) argued that the Plains archaeological sequence persistently includes four stages which are much like those for eastern North America. Plains prehistory is often described as an evolutionary sequence of adaptive stages, each involving more intensive economic patterns, more sophisticated technology, and greater sociopolitical organization. According to Michlovic (1986), however, the archaeological record does not justify this evolutionary model of four stages; instead, it supports a model of stable bison hunting. Thus, when evidence for change in Plains subsistence is observed in the archaeological record, it is not evolutionary change, but rather changes based on seasonal and geographic variation in resource availability.

It has been suggested that culture change on the Plains in prehistoric times was related to the productivity of bison herds (Reher 1977:36). If bison were numerous, they would be the focus of Plains subsistence. When bison were scarce, a change would occur to diffuse alternate adaptive patterns. Similarly, Michlovic (1986:213) noted that:

> Adaptational change on the Great Plains in antiquity apparently focused on the utilization of bison; if bison were scarce, then a diffuse foraging alternative was the common response. This alternative is a fluctuation in procurement routines, not directional or developmental change, because the people returned to the high yielding energy source of the bison herds.

Michlovic's basic argument is that there are only two major adaptations on the Plains, a bison hunting based subsistence pattern and a much later village agricultural subsistence system, rather than four developmental stages as presently believed. According to Michlovic (1986), this conceptual problem of evolutionary stages in Plains archaeology is due to the fact that archaeologists accept the idea that unbiased archaeology requires a concept of evolutionary progress through independent innovation. If we reject the idea of four evolutionary stages, as Michlovic (1986:213) has, diffusion assumes major importance. However, many archaeologists, as Michlovic noted, reject the concept of diffusion in explaining the variability in archaeological assemblages because diffusion only points to an origin, but it does not explain adoption. Furthermore, the term diffusion can refer to a great variety of processes: trade, movement of ideas and inventions, and direct or indirect culture contact. Also, many archaeologists suggest that hypotheses about diffusion or the absence of evolutionary progress are racist

in motivation (McNickel 1972; Trigger 1978,1980,1981).

> The archaeological community today appears to be saddled by a phobia about diffusion and cultural stability in prehistoric times, lest those who deny indigenous creative development, or claim significant diffusion, appear motivated by racism (Michlovic 1986:214).

Because archaeologists tend to see evolutionary progress even when the evidence points to stability and diffusion, Michlovic (1986:215) has defended the concept of diffusion and the process of intercultural exchange. A new trait may be added to a society, but it may not significantly transform that society, raising the question as to the extent new traits and new adjustments to those traits alter the relationships between the people and their environment. Furthermore, what constitutes an evolutionary shift? While evidence suggests that interaction of peoples led to the introduction of technical innovations on the Plains (for example, pottery), the fundamental elements of Plains adaptation remained more or less unchanged. Hence, the reason for Michlovic's (1986:214) argument for only two basic adaptations on the Plains.

Every culture undergoes constant flux as its members adjust to specific conditions, which themselves, are constantly changing (Michlovic 1986:209).

These adjustments, unless they have accumulated to the point that they have transformed the entire society, are not sufficient reason for hypothesizing more and more complex culture stages with a greater number of phases and complexes (Michlovic 1986:209).

> An evolution from one stage of culture to another is more than a matter of minor changes in the artifact inventory, or simple stylistic variation. (Michlovic 1986:209)

The evolution of a culture from one stage to the next should be evident in several archaeologically visible aspects of prehistoric life (i.e., subsistence, settlements, and artifacts). Such a change suggests a fundamental shift in the ways prehistoric peoples used their environment and ordered their social life, and therefore justifies being termed an evolutionary shift (Michlovic 1986:209). As a note of caution,

> not every artifact change evident in the archaeological record is part of progress toward a new stage unless "evolution" is simply taken to mean change, in which case the term loses its meaning. (Michlovic 1986:209)

If evolution is defined as change, it becomes a universal constantsince some sort of change is always occurring (Michlovic 1986:209). Major changes in subsistence, settlements, and artifacts must be observed before

arguing for an evolutionary shift from one stage or cultural formation to another.

Variability in Stone Tool Assemblages

Because no two lithic artifact assemblages are identical, archaeologists are continually faced with the problem of explaining assemblage variations. Similarities and differences in Avonlea and Old Women's Phase tool kits raise questions concerning ethnicity, natural development, culture change, diffusion, independent invention, trade, and imitation. We must question the validity of the assumption that changes in an archaeological tool kit indicate change in the cultural group.

Archaeologists have, on the basis of lithic assemblages which are only one segment of a total culture, reconstructed the course of human cultural development (Stockton 1977:340). Typically, archaeologists describe and classify these lithic artifacts in time and space to determine assemblage variations and to develop sequential frameworks. Only after this, can the nature of cultural change be examined (Stockton 1977:340).

Typologies

In order to describe and classify lithic artifacts into types, archaeologists devise typologies. These types are determined on the basis of clustering of a number of attributes such as shape, size, technology, raw material, cutting edge, and function. Ghosh (1977:148) argued that the primary basis of typological classification, indirectly and unconsciously, lies in speculation on function. Sackett (1982:78), however, believed that a given typology likely measures stylistically and functionally significant variability in a highly uneven manner. Still, archaeologists continue to argue as to which typology is most correct or accurate. But, as Binford (Gallus 1977:135; conference discussion) argued, no typology can claim general validity; instead there are only typologies created by archaeologists for specific tasks. It appears that developing multiple or alternative typologies allows us to obtain the maximum amount of information about formal variation (Sackett 1982:78).

Gallus (1977) supported an "organic" typological approach, where the concept of the tool type should match as closely as possible the idea formulated by the prehistoric artisan. Typology, in this case, is connected to need, function, use, performance, satisfaction, and fulfilment. A tool type, according to Gallus (1977:135), is the externalization or manifestatation of a

"tool-idea" for the fulfilment of a task (Gallus 1977:135). Changes in a tool type are directly connected with function and performance; it is dissatisfaction with the performance of a tool which prompts an artisan to change his tool idea (Gallus 1977). The tool form would undergo consistent improvement until the best solution possible has been attained. When this form has been externalized, the typological series stops and change can only occur again when the original tool-idea itself is creatively modified to form a new tool-idea. Then the sequence of improvements begins again.

Problems with this approach to typology are numerous. All change is seen as functional, no allowance is given for stylistic changes in tool form, and there is the assumption that a "perfect" tool form can eventually be obtained. This is a very mechanistic or functional approach allowing for no stylistic or individual variation.

Stockton (1977) stated that a typology that serves well the needs of prehistory should possess the following characteristics: (1) an objective description, (2) precise differentiation so that tool types do not blur the changes between periods and regions, and (3) the characterization of the whole assemblage. It is extremely important that one assemblage be compared to another on the basis of all its components rather than only one or a few. As Stockton (1977:341) pointed out, there is often a tendency to

define an industry by a single cultural marker or a "diagnostic" tool. This practice highlights one tool as if it were the most important in the tool kit, and therefore tells us nothing about similarities and differences between entire assemblages. For example, because projectile points are fairly common, widespread, and easily recognizable in prehistoric Plains sites, they have played a primary role in stratigraphic, chronological, and interpretive analyses. What needs to be stressed here is that projectile points comprise only a small part of the total inventory in the typical Plains archaeological assemblage. This suggests that interpretations about culture change and process should not be based entirely upon projectile point data, but rather upon comparison and analysis of the entire ranges of artifacts recovered in an archaeological assemblage.

Explanations for Variability

It has been commonly assumed that variation (i.e., artifact similarities and differences) in artifact assemblages, is related to cultural similarities and/or differences. Similarities between artifact assemblages were assumed to denote a common cultural tradition or heritage, while differences implied the presence of different cultural groups (White et al. 1977:380). There is

growing realization that assigning meaning to variation in the archaeological record is not always straightforward and not always a reflection of cultural similarities and differences (Reher and Frison 1980:94).

Although archaeologists in the 1940s were well aware of variation due to functional causes, such as the intended use of the artifact or physical properties of the raw material, debate centred upon the extent to which variation reflected learned or shared ideas about the proper shape of an object, that is, stylistic variation. Brew (1946), for example, argued that too many archaeologists believed in the reality of their abstract phylogenetic constructs, and mistakenly assumed that artifact similarities and differences were equivalent to ethnic similarities and differences. To him, typological systems were not automatically perceived from data, but could be imposed on data to measure various properties of the cultural record.

Spaulding (1953) employed statistical techniques to define attribute clusters, believing that types, reflecting conscious preferences and norms on the part of the prehistoric people, were inherent in the data. Ford (1954), on the other hand, argued that types were not inherent in the data and were only arbitrary devices used to chronicle cultures over time. For Binford (1977), typological classification was a heuristic analytical device, as Brew had suggested.

In order to have a clearer understanding of the past, variations in the archaeological record made evident through typologies, must be explained. The possible causes for artifact variation include: (1) the personality of the artisan, his preferences and skills which ultimately lead to individual differences within the bounds of a particular style; (2) the raw materials available for tool-making and the manufacturing techniques used; (3) lithic artifacts will vary with respect to their function or use for specific tasks; and (4) differences in style often occur between artifacts from different communities at different temporal and/or spatial locations (Clegg 1977:66; Crosby 1977:85-86). As Clegg (1977:60) pointed out, these factors are not necessarily independent factors, but rather are most likely interconnected with each other.

## Style Versus Function Debate

The style versus function argument has long been the centre of debate over artifact variability. Does variation in the archaeological record reflect cultural traditions and distinct societies, or patterns of behaviour which may be common to many such societies? (McBryde 1977:225)

Binford (1986) saw style as adjunct or added on to lithic tools and thus

viewed style as being conscious and separate from function. He has argued that style occupies a distinct and self-contained realm of form exclusive to itself. Style or ethnicity is completely separate from function or activity according to Binford.

Sackett (1982,1986), on the other hand, argued that style is an unconscious choice or selection from all available functional options or isochrestic (i.e.,"equivalent in use") equivalents. To him, style is not a distinct form in itself, but rather an aspect inherent in virtually all artifactual variation. Formal variation is, therefore, dualistic in nature, with function and style constituting fully complementary or crosscutting aspects of formal variation. Sackett also suggested that style can be found in debitage, butchering techniques, raw material choice, and other activities. Ethnic variation is not only found in stone tools as Binford seems to imply, but also in other cultural activities and artifacts. Thus function and style cannot be separated, because style is the selection of all available functional options: style is often built in, rather than added on (Sackett 1986:630).

In reference to the Plains, Duke (1988) argued that with projectile points, it is difficult to separate attributes of function from those which are stylisitc, whereas with pottery, it is much easier to differentiate between style and function. This view is also supported by Voss (1977) who argued that style in

lithic artifacts is difficult to study as they bear little obvious decoration.

As Reher and Frison (1980:142) pointed out, the two forms of variation (style and function) are, in reality, extremely difficult to separate, raising the problem of defining style and recognizing stylistic variations in archaeological contexts. Most likely, stylistic variants occur at several different levels of abstraction (Hayden 1977:187) and are often interconnected with other factors such as function, raw material type, and individual variation.

Perhaps one of the more well known debates over the style/function issue is that of the question of the great variability in Mousterian complex assemblages throughout the Old World. While Bordes (1961; with de Sonneville-Bordes 1970) supported the idea that different ethnic groups were responsible for the variability, L. Binford and S. Binford (1966) argued for functional differences (as a result of different activities and seasons) as the primary causes of Mousterian variability.

## Case Studies in Variability

Numerous ethnoarchaeological studies have indicated that although social information is contained in material culture, the correspondence is not straightforward (Hodder 1978). Archaeologists have tended to assume that

ethnic affiliation leads to variability in material culture, particularly projectile points, and that the possibilty exists that ethnic groups can be distinguished on the basis of projectile point morphology. Although Wobst (1977) suggested that the artifact is an item which can be highly effective in establishing and maintaining ethnic group boundaries and that some artifact attributes function solely as a means by which ethnic affiliation is displayed, the effect of ethnic affiliation on variability in lithic artifacts has not been satisfactorily defined or quantified (Greaves 1982:21).

Greaves (1982) has used multivariate statistical techniques to test the hypothesis that ethnic affiliation is a source of metric variability in Late Plains Side-Notched projectile points. She chose twelve sites previously identified as belonging to any one of four ethnic groups present in the Northwestern Plains and adjacent mountain systems. With a sample size of 348 points from these chosen sites, Greaves recorded 24 variables for each point and then subjected the data to factor analysis. The results indicated that notch angle and dimensions, as well as the angle and edge of the base accounted for a major portion of the variance, with projectile point body length being the most significant attribute for explaining variability between points (Greaves 1982:97). She concluded that it is possible to discriminate between ethnic groups on the basis of projectile point morphology and that ethnic affiliation

therefore is a source of variability in Late Plains Side-Notched points.

However, problems exist with this type of study. One must, firstly, ensure that all sources of variability except those attributable to ethnic causes can be controlled. For example, artifacts must be from identical contexts, have identical functions and so forth. Unfortunately, Greaves assumed prior to the study, which variables were responsible for ethnicity. Secondly, she did not take into account the effect of raw material type. It is entirely possible that rather than reflecting ethnicity, variability could reflect function, raw material type, technological factors involved in hafting, or individual flintknapper's characteristics. How can ethnicity or stylistic variation be separated from functional and other variation? Also, with regards to length being the most significant attribute for explaining variability and thus ethnicity, Greaves does not take into consideration the possiblity of points being broken and then reworked. As Flenniken and Raymond (1986) have argued, a single point type may actually manifest more than one time-sensitive shape throughout its life due to hafting, use, breakage, and rejuvenation. Length, therefore, could also relate to the breakage of points and raw material type, availability and value (whether exotic or local).

In a similar study dealing with ethnicity and points, Wiessner (1983) compared stylistic variation in Kalahari San projectile points with aspects of

San social organization. She concluded that although the projectile point had a limited number of alternative designs due to restrictions imposed by materials, technology, and function, it was well suited for carrying information about groups and boundaries because of its widespread social, economic, political, and symbolic import (Wiessner 1983:272). Wiessner also found that the stylistic information contained in San projectile points was a good indicator of linguistic group boundaries. One problem that Wiessner (1983:273) encountered in her study was that style, however, could be contained in a wide range of attributes on projectile points including those that might have important functional properties, again pointing out the difficulty of differentiating between stylistic and functional traits. Different attributes on projectile points can simultaneously carry different kinds of social information. Therefore, the choice of attributes in which style was invested was found not to follow any regular or coherent pattern (Wiessner 1983:270). As Wiessner stresses, the projectile point is only a single item and therefore capable of providing information about only some aspects of social organization. Thus, stylistic variation in other items must be considered as well (Wiessner 1983:273).

Projectile points from the Vore site, a prehistoric buffalo jump in the Black Hills of northeastern Wyoming, were subjected to factor and discriminant

analysis. Reher and Frison (1980) reasoned that since the site was restricted functionally (i.e., a kill site), variation in points would most likely be due to ethnicity and style. Their analysis determined that basal attributes served best to differentiate between levels, because they allowed for more stylistic latitude (Reher and Frison 1980:142). Points from the lower half of the stratigraphic sequence at the site appeared stylistically homogeneous while points from the upper sample excavation levels were rather distinct from one another, suggesting that the first part of the cultural sequence may have been culturally quite homogeneous while the upper half documents a series of different groups moving through the area. Still, one could argue that the variability in the points from the upper strata may not necessarily reflect ethnicity or different cultural groups; it could mean that the local population was producing a greater variety of point types for various undetermined reasons.

Using methods and techniques of population biology to classify artifacts, Crosby (1977) analyzed percussive cutting implements from Melanesia and the problems involved in their classification and morphological variation. Each artifact population was selected so it would be homogeneous and could be described by a single statistical statement of its morphological homogeneity (Crosby 1977:85). She determined that populations of

percussive cutting implements rarely coincided with ethnic or linguistic distributions, or subdivisions of the natural environment. Her studies suggest that the social controls postulated over style can in some cases extend beyond ethnic boundaries and that it is possible for the agreed range of variation which constitutes a style to vary from group to group of craftsmen (Crosby 1977:95). Crosby (1977:95) concluded that her analysis does not support the hypothesis that a morphologically homogeneous population can be equated to style in Melanesian cutting implements.

In examining several contemporary site assemblages in northeastern New South Wales, McBryde (1977) discovered two kinds of variation. The first, a major variation, was found between sites on the coast and those on tableland while the second "finer" kind of variation occurred within each region. In order to answer the question of whether these variations were due to two separate culture-provinces or due to distinct tool kits in response to different subsistence and adaptations, McBryde (1977) tested various hypotheses. She determined that the hypothesis based on environmental and economic factors was the most satisfactory for explaining variations and argued for two major adaptive situations corresponding to the coastal region and tableland, each with its own sub-strata of economic adaptation (McBryde 1977:249). Because the two major assemblages share many elements,

McBryde (1977:249) believed it was inappropriate to refer to them as two culture-provinces. Instead, the variations were seen as most likely the result of environmental and economic factors.

Substantial intersite differences in the composition of stone tool assemblages in the Sandover River area of central Australia, were analyzed by O'Connell (1977). It appears that most interassemblage variation in Australia was usually explained either as a result of function, occurring because of differences in the range of activites carried out at particular sites, or as a result of stylistic variation, reflecting certain traditional standards applied in the manufacture of artifacts (O'Connell 1977:280). However, O'Connell (1977:280) has argued that the data he presented which indicate a substantial amount of interassemblage variation in this region, may be the result of differences in access to material used in the manufacture of tools. He concluded that both access to and the mechanical characteristics of lithic material must be considered when defining tool categories and in assessing the significance of variation in the frequency of those categories between assemblages (O'Connell 1977:281).

A final study comes from the Western Highlands of Papua New Guinea, where White and others (1977) used ethnographic data to test concepts of archaeological culture and mental templates. Their data suggested that

because of high residential mobility, artifacts selected for specific tasks in different parishes exhibited little variation, suggesting that the current residential pattern prevents the development of locally different artifact traditions (White et al. 1977:385). There also appeared to be a general agreement throughout the parishes on the ideal form of a tool type, suggesting that because function and material were similar, it resulted in similar artifact forms (White et al. 1977).

In summary, these studies indicate that variability in tool assemblages, whether archaeological or present day, is not always due to either stylistic or functional factors but often a combination of the two or due to entirely different factors such as raw material choice, individual craftsmen capabilities and preferences, economic and environmental factors including different seasonal or subsistence patterns. It is therefore reasonable to conclude that assemblage variability is often more complex than is immediately apparent and that it most likely reflects a multiplicity of factors.

## Points and Prehistory

Archaeologists generally believe that classification schemes should be composed of categories perceived by prehistoric artifact makers (Reher and

Frison 1980:97). In this way, artifact types are seen as a means of providing ethnic or cultural information and this inevitably leads to the practice of equating style or type to ethnicity and culture.

Rouse (1972) cautioned against assuming that archaeologically definable cultures or phases can be equated typologically with historic cultural groups. An ethnic group is composed not just of cultural traits (which archaeologists use as a basis for delineating prehistoric phases or cultures) but also of social, linguistic, and morphological diagnostics and the boundaries of these traits may not be entirely congruent. Consequently, it is possible for two or more language groups to share a single material culture or for certain traits to be shared in different ways with neighbouring ethnic groups. Rouse (1972) believed that to define a tribal group on the basis of material traits alone was very hazardous. This raises the entire issue of how useful and valid the concept of the archaeological culture is in distinguishing peoples in prehistory (McBryde 1977:225). The idea that single classes of archaeological remains are equivalent to cultural groups is a common but rarely tested assumption in archaeology.

Byrne (1973) argued, however, that until more refined techniques are developed for isolating archaeologically distinct ethnic populations, we are forced to assume that material units roughly correspond to ethnic groups. But

it must be stressed that this assumption can be erroneous because single artifact complexes may have been and probably were shared by more than one social, morphological, and linguistic community (Byrne 1973:556).

In Plains prehistory, this problem is further exacerbated by the tendency to overemphasize the importance of projectile points in interpretation. Archaeologists are often forced to utilize the most distinctive trait or feature which exhibits definite temporal changes to delineate cultural "groups" and "phases". As Reher and Frison (1980:98) pointed out, projectile points have had a more significant place in the study of Plains Archaeology than in other North American study areas.

Their high archaeological visibility together with the assumption that points convey ethnic identity probably have resulted in an overemphasis on their prehistoric value (Dawe 1987:159). Unfortunately, this heavy preoccupation with projectile point types and styles has often led to the creation of projectile point cultures or the equation that "points equal culture equals people". For example, the Avonlea point, along with other diagnostic points, has acquired cultural historical connotations, particularly as the physical signature of a distinctive cultural entity (Stanfill 1988:251). In essence, points are considered equivalent to culture. Furthermore, the implication is that the further away the point is stylistically from the archetype,

the greater the cultural divergence. Many archaeologists assume that variability among points reflects variability in perceptions and culture (Stanfill 1988:252). However, Stanfill (1988:252) has argued that morphological typologies are often founded on false assumptions about the nature of flaked stone tool manufacture. This results in inappropriate, unsupported, and often misleading conclusions about cultural identifications. For example, a common assumption is that a cultural group made only one projectile point type. But as Stanfill (1988:251) pointed out, there is nothing in the shapes of projectile points or the mechanical laws of flaked stone technology that precludes a cultural group or individuals within that group from making more than one morphological type. Dawe (1987:160) has even suggested that arrowheads were most probably extremely expedient tools, used only once, broken, and then discarded. If arrowheads had this short use life, Dawe (1987:160) hypothesized it would seem unlikely that significant stylistic attributes signalling ethnicity would have been invested in these artifacts. However, as Flenniken and Raymond (1986) and Hoffman (1985) have noted, projectile points may not have been strictly expedient since they were often resharpened and reused.

A point type should not necessarily be equated with one cultural or ethnic group just as a phase should not be viewed as a prehistoric ethnic unit.

To assume a phase is the archaeological representation of an ethnic group is to assume a simplistic one-to-one equivalency between material culture and social group (Duke 1988:265). As both Duke (1988) and Stanfill (1988) point out, it is no longer valid to assume that the distance between archaeological artifacts or assemblages is a measure of cultural divergence, social interaction, or separation. Duke (1988:265) further argued that points are particularly unsuitable for ethnic group identification.

Too often Plains archaeology has concentrated only on projectile points, at the exclusion of other aspects of material culture, resource selection and use, subsistence and settlement patterns, and other information which can be derived from the archaeological record. Our picture of prehistoric lifeways will increase in proportion to the extent we can include other lines of evidence. However, Plains archaeologists have a tendency to focus exclusively on projectile point data. For example, with reference to the Early Plains Indian period in Saskatchewan, Dyck (1983:79) used only projectile points for determining traditions because, as he sees it, "other parts of the tool kit are fundamentally similar from one complex to another". In essence, Dyck is dismissing all other assemblage data and suggesting that only projectile point data can provide relevant information.

There has even been debate concerning the use of points as

time-markers. As noted earlier, Flenniken and Raymond (1986) suggested that points provide only a fractional glimpse of the entire story. Instead of just looking at point types, one must record the entire reduction sequence (raw material acquisition, stone reduction, tool manufacture, hafting, use, reuse, and discard) in order to construct a cultural chronology based upon flaked stone artifacts (Flenniken and Raymond 1986:611). Thomas (1986:621) has argued that Flenniken and Raymond's conclusions are flawed. Tool use and maintenance does not preclude the use of projectile points as time-markers. Morphological points which have been repeatedly tested stratigraphically, do have chronological significance and therefore use-life evolution (hafting, use, reuse, etc.) is irrelevant at the level of cultural chronology (Thomas 1986:622).

Hoffman (1985) argued that previous point typologies are based on a normative-empiricist viewpoint where chipped stone tools are seen as static entities and variation is considered irrelevant, the important factor being to discover inherent shared characteristics and attributes of artifacts. Variables used to define point types were chosen intuitively with no consideration of a tool's use-life (Hoffman 1985:572). This is misleading, according to Hoffman (1985), because when choosing variables to define classes and establish typologies, tool manufacturing, use, and maintenance must be taken into

consideration as well as those variables which may be relevant to the specific problem or theoretical concerns. Studying a sample of projectile points from the Tennessee Valley area and using multivariate statistical analyses, Hoffman (1985) discovered that variation in point blade size and blade angle is probably due to resharpening and modification rather than being representative of different point types, as normative-empiricist typologies have assumed.

Therefore, there is a need to revise many of our typologies and acknowledge the importance of the modifications of a tool through its use and maintenance (Hoffman 1985:605). Hoffman (1985:606-607) even suggested that size, shape, and technological characteristics of point stems rather than blades may have more relevance for establishing point typologies that are reflective of social units possessing spatial/temporal significance because the stem, being hafted, is rarely altered or modified.

It must be remembered that the projectile point temporal type is a heuristic device used to document change through time in the archaeological record, but why this change occurred is an entirely different matter. This involves the concepts of "systematics" and "dynamics", the study of both, which is vital for a fuller understanding of the Plains way of life. While the use of the projectile point type provides a sequence of cultural occupations in a

region ("systematics"), "dynamics" attempts not only to document but also to explain the cultural changes which are observed in the archaeological record occurring within and between archaeological populations (Byrne 1973:439). Obviously, the understanding of the "systematics" of an area is necessary before approaching the issue of "dynamics"; however, it is the studying of "dynamics" of an archaeological region that should be among an archaeologist's primary concerns and goals.

## DISCUSSION

One of the major problems in Plains Archaeology is that the temporal phase has been regarded as equivalent to the projectile point type which is diagnostic of the phase. For example, the presence of an Avonlea or Avonlea-like point results in the immediate assumption that it must be representative of the Avonlea Phase peoples. These are the kinds of problems that arise when a phase is named after a diagnostic projectile point. A change in artifacts, (in the Avonlea/Old Women's case, projectile points) does not necessarily mean a change in cultures. As Donahue (1977:88) has argued, it is impossible to determine from artifacts the language spoken by a

people. Furthermore, race, language, and culture are independent of each other and are not necessarily affected by each other. Consequently, the various cultural systems, including language, must be considered as having the possibility of evolving and changing independently (Donahue 1977:88). The same thing can be argued for projectile points. There is probably a strong possibility that points may change with no associated change in culture or ethnic affiliation.

It can be demonstrated that specific point types are not always diagnostic of particular bands or tribes, as generally assumed. One culture does not have to be limited to making one projectile point type: it is highly possible that a group made multiple point types which may have served different functions or represent various stylistic expressions. Consequently, it is not valid to assume that a change in projectile point style will automatically reflect a change in cultural groups or ethnicity.

These erroneous assumptions often come about because of a tendency among archaeologists to over-interpret stone tools (Isaac 1977:5). How reliable are stone tools as indicators of specific tasks and seasonal activities, for differentiating between distinct cultural groups in both space and time, and for providing information about economic and ecological relationships? Obviously there is a need to assess the limits to the kinds of information that

can realistically be derived from stone artifacts. A proper understanding of past cultures will not come from stone tools alone but from all recovered artifacts in their total context.

> We need to concentrate our efforts on situations where the stones are only a part of a diverse record of mutually related traces of behaviour and adaptation. (Isaac 1977:11)

With regards to culture change, as Michlovic (1986) argued, an evolution from one phase to another, and similarly a change in ethnicity or culture groups, is more than a simple stylistic variation in stone tools. Changes should appear in several aspects of prehistoric life before one can assume a major change in culture. One cannot just discuss artifact change as relating or being equivalent to culture change; rather, a systemic approach should be taken when studying change. Furthermore, each situation is different and therefore must be studied in its specific context; trying to find universal laws for culture change is tempting but problematic.

> The essential problem is to isolate variables of recurring importance in change, to explain the relationship between these variables, and thereby to use laws in explaining why cultures change as they do in specific instances. (Plog 1974:10)

# CHAPTER TWO

# ARCHAEOLOGICAL EVIDENCE

## INTRODUCTION

Numerous Late Prehistoric Plains sites on the Plains display lithic assemblages identified as belonging to the Avonlea and/or Old Women's Phases. The purpose of this chapter is to review the archaeological database on which current interpretations of Late Prehistoric period dynamics are based. A review of these data will, hopefully, aid in resolving some of the issues surrounding the Avonlea/Old Women's dichotomy. A detailed analysis of the continuity and/or discontinuity between the two phases will be conducted in order to obtain a clearer picture of exactly what kinds of phenomena were changing between the Avonlea and Old Women's Phases.

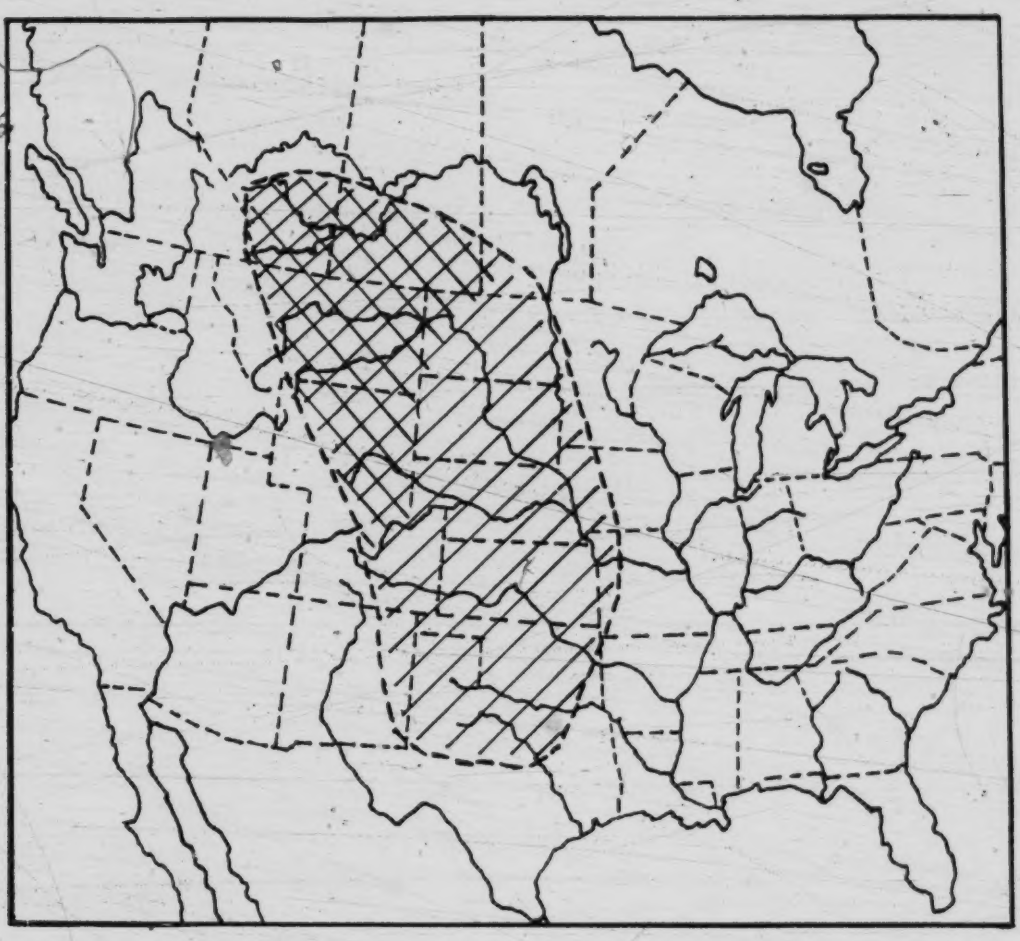
The sites chosen for analysis were selected because, firstly, they were from published sources and could provide abundant data concerning lithic and ceramic assemblages, or secondly, they had both Avonlea and Old Women's assemblages and could thus provide relevant information which would be helpful in determining the Avonlea/Old Women's Phase relationship. The sites discussed in this thesis do not represent an

exhaustive list of Avonlea and Old Women's Phase sites.

It will be necessary to provide a brief introduction to the Northwestern Plains cultural sequence, in particular, the Late Prehistoric Period. I will then consider Avonlea sites, followed by Old Women's sites and lastly multi-occupational sites which exhibit characteristics and traits from both phases. The site discussions will concentrate primarily upon lithic and ceramic data, and only briefly touch upon feature and faunal data which is beyond the intended scope of this thesis.

## THE NORTHWESTERN PLAINS CULTURAL SEQUENCE

The Northwestern Plains, as defined by Wedel (1961), encompasses the short grass plains of Alberta, Saskatchewan, Montana, the Dakotas, and Wyoming (Figure 1). Mulloy (1958) was the first to subdivide Northwestern Plains prehistory into three segments: Early, Middle, and Late Prehistoric Periods. For the Alberta portion of the Plains, Wormington and Forbis (1965:183-198) also used a three-fold system: Paleo-Indian, Meso-Indian, and Neo-Indian periods. Later, Forbis (1970) revised Alberta prehistory divisions to Early Lithic, Middle Lithic, and Late Lithic. Subsequently, Reeves



Plains Area of North America

Northwestern Plains ( as described by Wedel 1961)

Figure 1. The Plains of North America ( modified from Espenshade 1980:80)

(1969, 1983a) adopted Mulloy's (1958) original divisions and nomenclature for Alberta prehistory, defining each period with a specific time range and an easily recognizable and widespread technological trait. Most often, projectile point types are the main identifying criteria for complexes or phases within each of these periods because the cultural sequence in much of northwestern North America has been developed on the basis of these implements (Reeves 1969:19). Reeves' (1969, 1983a) framework, outlined below, stands today as the basic structure for interpreting the Alberta cultural historical sequence (Vickers 1986:4).

The Early Prehistoric Period (ca. 10,000 B.C.-ca. 5500 B.C.) has archaeological "units" characterized by projectiles or projectile point systems presumably designed for use as, or on, a heavy spear, of the type usually used for throwing or stabbing. Point types in these systems are variations on the lanceolate point theme and complexes include Clovis, Folsom, Agate Basin, Cody, Frederick, and Lusk.

The Middle Prehistoric Period (ca. 5500 B.C.- A.D. 200-700) has archaeological "units" characterized by projectiles or projectile point systems supposedly for use with the atlatl or spear thrower (Figure 2). Complexes known for the Plains include the Plains Archaic, Oxbow, McKean, Duncan, Hanna, Pelican Lake, and Besant. Point forms include a variety of unnotched,

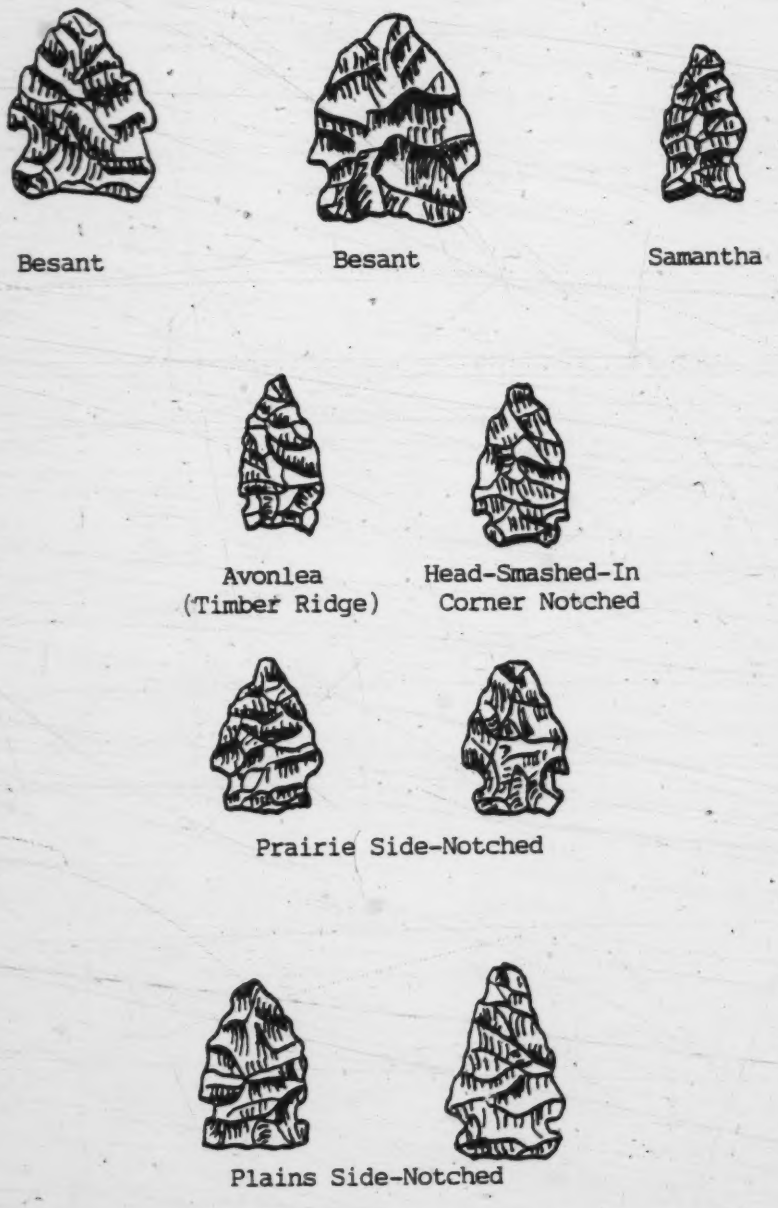



Figure 2. Projectile Points of the Middle and Late Prehistoric Periods (modified from Vickers 1986)

stemmed and notched forms.

The Late Prehistoric period (A.D. 200-700- A.D. 1725) has archaeological "units" with projectiles or projectile point systems which were presumably manufactured for use with the bow and arrow (Figure 2). Point forms include a variety of unnotched, stemmed and notched forms. Complexes, phases, and point types occur in profusion in this period (Reeves 1983a:36-37).

Reeves (1969,1983a) has also proposed two cultural traditions for the Saskatchewan River Basin area in Alberta and Saskatchewan for the last two and a half millennia: the TUNAXA and NAPIKWAN. He defines a tradition as:

> ... persistent configurations in a number of cultural sytems which interact to produce an archaeological unit distinct from all other archaeological units conceived on the same criteria. (Reeves 1983a:40)

The cultural tradition thus represents continuity in a variety of cultural expressions (artifacts, technology, settlement, and subsistence) between phases (Vickers 1986:15). The TUNAXA tradition links the McKean, Hanna, Pelican Lake, and Avonlea phases while the NAPIKWAN links Besant and Old Women's phases (Reeves 1969,1983a). The Late Prehistoric period as well as the TUNAXA tradition and NAPIKWAN traditions are of concern to this

study because they encompass both the Avonlea and Old Women's Phases.

## THE LATE PREHISTORIC PERIOD

The shift between the end of the Middle Prehistoric period and the Late Prehistoric period is represented by a gradual change spanning several hundred years during which time the atlatl dominated Besant complex of the Middle Prehistoric period coexisted with the bow and arrow dominated Avonlea complex of the Late Prehistoric period (Brumley and Dau 1988:38). The beginning of the Late Prehistoric period (A.D. 200-500) is generally marked by the common occurrence of clay pottery and side-notched arrow points in archaeological assemblages. Pottery is thought to have been derived from eastern sources while the use of the bow and arrow presumably came from the west ( Dyck 1983:110). Although some Middle Prehistoric Besant and Pelican Lake points are thought to be arrowheads, it is not until the Late Prehistoric period that the bow and arrow truly dominates (Brumley and Dau 1988:37). Similarly, although pottery is recovered from a few Middle Prehistoric Besant sites, it increases in frequency in Late Prehistoric Avonlea and Old Women's sites. Bison hunting continues to be the primary subsistence activity, and as Brumley and Dau (ibid.:38) note, evidence for

Late Prehistoric communal bison kills appears to reach a peak in terms of the number of sites and their magnitude.

Kehoe (1966) proposed three divisions for the Late Prehistoric period based on point types: Avonlea, Prairie Side-Notched, and Plains Side-Notched. In Saskatchewan, Dyck (1983) divided the Late Prehistoric period into the earlier Avonlea and the subsequent Late Side-Notched Series which includes both Prairie and Plains Side-Notched points. For the Alberta Plains, Vickers (1986) uses a two phase division based on diagnostic projectile points and ceramic types: an earlier Avonlea Phase and a later Old Women's Phase which includes both Prairie and Plains Side-Notched points. In this study, I will use Vickers' scheme.

## THE AVONLEA PHASE

### Distribution

The Avonlea Phase, beginning on the Northern Plains around A.D. 200, ushers in the Late Prehistoric period on the Plains. It apparently coexisted with the Besant Phase of the Late Middle Prehistoric period for some time and continued until approximately A.D. 800 to A.D. 1000 (Reeves 1983a).

Reeves (1983a:101) has argued that Avonlea is basically confined to the

Plains, west of the Middle Missouri area, north of the Platte drainage and Big Horn-Shoshone Basin, east of the Rocky Mountains, and south of the Boreal forest in Alberta, and Saskatchewan, and the Parkland in Manitoba. Vickers (1986:92), however, indicated a wider distribution in Alberta, noting that Avonlea sites are found throughout the Parkland, Plains, Foothills, and mountain front of Alberta. Furthermore, a recent symposium dealing with Avonlea (Davis 1988) has revealed a geographical distribution of Avonlea points and assemblages more extensive than the Northwestern Plains "hearth" area of southern Alberta and Saskatchewan and northern Montana.

For example, Avonlea points, similar to those from the type site, were recovered from a number of sites in the southern edge of the Mixed wood forest of Saskatchewan (Meyer et al. 1988), and from a site within the Parkland zone of southeastern Saskatchewan (Smith and Walker 1988). Several Avonlea bison kill sites have been found along the Milk River Drainage in north-central Montana (Tratebas and Johnson 1988; Ruebelmann 1988; Wilson 1988), along with a unique Pronghorn kill site in the High Plains of north-central Montana (Davis and Fisher 1988). In eastern Montana, however, Avonlea sites appear to be rare (Fraley 1988).

Further south, Avonlea sites are widespread throughout Wyoming but are few in number compared to the non-Avonlea sites of the same time period

(Frison 1988). Avonlea points have been recovered from a few sites in South Dakota as well (Hannus and Nowak 1988). Avonlea components are present as far south as the Missouri but further south, the presence and distribution of Avonlea materials is much more limited and sporadic (Brumley and Dau 1988:41). In the west, recent discoveries of Avonlea points in the Kootenai region have expanded Avonlea distribution into northwestern Montana and southeastern British Columbia montane regions (Roll 1988).

The eastern distribution in Manitoba is poorly understood. Surface finds of Avonlea points have been discovered west of the Red River and north into the mixed woods area, but very few points have been found in excavated sites. Those recovered from excavations are dated relatively late, suggesting to Joyes (1988) that the phase may have been first "coordinated" and "integrated" in southern Alberta, reaching Manitoba at a relatively late date. However, Vickers (1986) and Dyck (1983) have both commented that the number of known Avonlea sites in southern Alberta and Saskatchewan is lower than the number of sites dating to other phases, but do not offer any explanation for this situation. Milne (1988:65) suggested that this may have been due to a decline in human population at this time in southern Alberta, although she offers no apparent reason for the population to decline.

Characteristics

Reeves (1983a) outlined the characteristics of the Avonlea Phase applicable to the Northwestern Plains, primarily those sites in southern Alberta, Saskatchewan, and northern Montana. These characteristics include:

(1) a low frequency of unnotched points and the presence of Head-Smashed-In Corner-Notched and Timber Ridge Side-Notched points;
(2) asymmetric bifaces which tend through time from ovate to lanceolate and the presence of diamond-shaped bifaces;
(3) pointed unifacial flakes; bifacial and unifacial cobble, core, and flake choppers;
(4) excavated basin-shaped, rock-filled hearths;
(5) distinctive lithics in northern Montana-Saskatchewan Basin area;
(6) fabric or net impressed ceramics with punctate design;
(7) and pit burial pattern (Reeves 1983a:161-162).

The most distinctive characteristics of Avonlea assemblages are finely made, side-notched points which are apparently all arrow tips (Vickers 1986:90). There are several varieties of Avonlea points but only Avonlea triangular, Timber Ridge Side-Notched, and Head-Smashed-In Corner Notched points are commonly found in Alberta (Vickers 1986:90). In addition, Reeves (1983a:17) sees Avonlea stone technology as being

characterized by a microlithic, punched blade-core tradition involving small conical and hemi-conical [sic] cores and production of prismatic bladelets.

Since 1970 and the writing of Reeves' thesis (Reeves 1970), a tremendous increase in the knowledge of Avonlea, as evidenced by the Avonlea Symposium of 1984 (Davis 1988, editor), has forced us to reconsider some of these previously believed attributes and characteristics of the Avonlea Phase, especially with regards to ceramics. For example, although T. Kehoe (1966) originally described the Avonlea Phase as being aceramic, there is now ample evidence that indicates Avonlea assemblages are associated with pottery, that of the Early Variant Saskatchewan Basin Complex type proposed by Byrne (1973). As listed above, it was generally believed that only net-impressed pottery was typical of the Avonlea Phase(Reeves 1983a), but more and more parallel grooved pottery is being found in Avonlea assemblages (Tratebas and Johnson 1988:95; Johnson 1988). Parallel grooved ceramics are found over most of the Northern Plains and radiocarbon dates suggest an initial occurrence of approximately A.D. 500 to A.D. 1000 (Johnson 1988). Differences in surface treatments and slight differences in the distribution of parallel grooved and net impressed ceramics suggest separate origins, influences, interactions, and contact (Johnson 1988:141). The Parallel grooved type is less common in the Prairie

provinces than the net-impressed, while net-impressed is essentially absent from Montana and the Dakotas during the early part of the Late Prehistoric (Johnson 1988:141). Johnson (1988:140) suggests the source of parallel grooved pottery is not from previous ceramics in the Northern Plains but rather possibly from outside influences or innovations within certain Avonlea populations. Quigg (1988a) also notes that Avonlea ceramics south of the Parklands indicate that net-impressed is the primary style throughout the phase (A.D. 400-1300) while parallel grooved (A.D. 400-A.D. 850) and plain are present during specific intervals within this phase. However, at other Avonlea sites, especially those in Montana, ceramics are often absent thus suggesting a pattern of differential ceramic utilization within Avonlea (Brumley and Dau 1988:44).

With regards to lithics, Avonlea assemblages strongly indicate the use of locally available lithics such as cherts, quartzites, and chalcedonies. Use of exotic lithics such as Madison Formation cherts from central and southern Montana, Knife River Flint (KRF) from North Dakota quarries, obsidian from the Yellowstone Park area in northwestern Wyoming, and porcellanite from various quarries in Montana and Wyoming, is reported to be relatively rare in Avonlea assemblages (Brumley and Dau 1988:42).

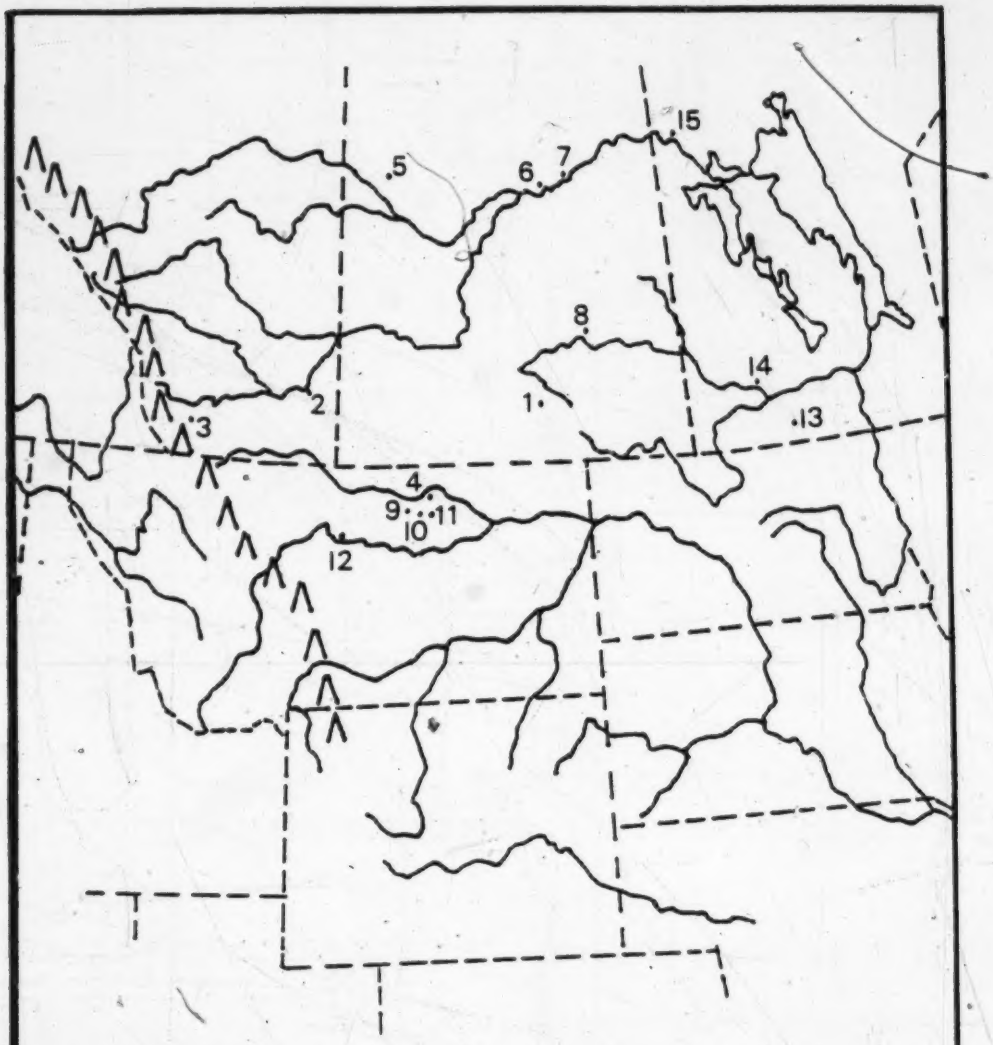
# AVONLEA SITES

## Avonlea Site (EaNg-1)

Introduction. The Avonlea site (EaNg-1), the type site for the Avonlea Phase, is located five kilometres east of the town of Avonlea in south-central Saskatchewan (Figure 3). It was only briefly test excavated in 1956 and a full site report has not yet appeared. However, a radiocarbon date of 1500±100 B.P. (A.D. 450 uncorrected) was obtained for the Avonlea deposits (Kehoe & McCorquodale 1961). Recently, several excavations have been conducted at the site (Kehoe et al. 1988; Klimko and Hanna 1988). These excavations reaffirmed that this is a single component site characterized by Avonlea type points. Unfortunately, since 1956, the upper 20 cm of the site has been disturbed by cultivation.

Lithic Assemblage. Lithic artifacts recovered include Avonlea type points, cores, bifaces, end/sidescrapers, and retouched flakes. Debitage was dominated by Swan River Chert, chalcedony, and KRF lithic types while points were primarily manufactured from Swan River Chert, KRF, chalcedony and various cherts (Table 1).

Ceramics and Bone Tools. Pottery recovered from both 1956 and 1984 excavations at the Avonlea site consisted of four vessels, paddled with a




1. Avonlea Site
2. Larson Site
3. Manyfingers Site
4. Henry Smith Site
5. Yellowsky Site
6. Mineral Creek Site
7. Gravel Pit Site
8. Lebret Site
9. Fantasy Site
10. Beaver Bend Site
11. TRJ Site
12. Lost Terrace Site
13. Avery Site
14. Stott Site
15. Pas Reserve Site

(modified from Klimko 1985:68)

Figure 3. Location of Avonlea Sites Described in Text

| | Debitage | Cores | Points | Bifaces | Unifaces | Retouched & Utilized Flakes | Total | % |
|---|---|---|---|---|---|---|---|---|
| Chert- Swan River | 937 | 4 | 15 | 3 | 3 | 10 | 972 | 42.40 |
| - Black Pebble | 3 | - | - | - | - | - | 3 | 0.13 |
| - Limestone | 1 | - | - | - | - | - | 1 | 0.04 |
| - Misc. | 55 | 1 | 4 | - | 2 | 3 | 65 | 2.83 |
| Quartz | 5 | - | - | - | - | - | 5 | 0.21 |
| Quartzite | 36 | 1 | - | - | - | 1 | 38 | 1.65 |
| Jasper | 62 | 2 | - | - | 1 | - | 65 | 2.83 |
| Chalcedony | | | | | | | | |
| -KRF | 314 | 3 | 19 | - | 4 | 9 | 349 | 15.22 |
| - White | 63 | 1 | - | - | - | - | 64 | 2.79 |
| - Sask. R. | 305 | 3 | 7 | 1 | 2 | 5 | 323 | 14.09 |
| - Misc. | 8 | 1 | - | - | - | - | 9 | 0.39 |
| Petrified Wood | 27 | - | - | 1 | - | 2 | 30 | 1.30 |
| Hematite | 1 | - | - | - | - | - | 1 | 0.04 |
| Altered Felsic Lava | 2 | - | - | - | - | - | 2 | 0.08 |
| Sandstone | 2 | - | - | - | - | - | 2 | 0.08 |
| Basalt | 3 | - | - | - | - | - | 3 | 0.13 |
| Shale | 33 | - | 1 | - | - | - | 34 | 1.48 |
| Rhyolite | 24 | - | - | - | - | 1 | 25 | 1.09 |
| Porcellanite | 55 | 2 | 3 | - | 1 | - | 61 | 2.66 |
| Ironstone Conc. | 43 | 1 | - | - | - | - | 44 | 1.91 |
| Misc. | 196 | - | - | - | - | - | 196 | 8.55 |
| Totals | 2175 | 19 | 49 | 5 | 13 | 31 | 2292 | 99.92 |

Table 1. Avonlea Site Lithic Data (data from Klimko & Hanna 1988:27)

grooved or thong-wrapped paddle to produce simple stamped ceramics (Hanna 1986:33). The four vessels were remarkably similar in style and technology. With regards to style, the vessels were conoidal in shape, with a surface decoration consisting of horizontal over oblique grooved or thong-wrapped paddle impressions, and decorations confined to the top of the lip (Hanna 1986:36). The vessels were constructed with coarse temper particles, with a fairly high proportion of temper in the paste. Coiling was possibly used in formation of at least one vessel. There was little paddling to compact the paste which resulted in a friable ceramic product. A low temperature, open firing in a possibly non-oxidizing atmosphere, was used in manufacturing the vessels. Lastly, at least two of the vessels showed extensive deposits of carbonized remains, suggesting use as cooking vessels (Hanna 1986:36). The presence of pottery, believed to be a warm season craft, suggests a possible non-winter occupation (Klimko and Hanna 1988:29). Bone tools were also recovered from excavations.

Faunal Assemblage. Bone fragments were poorly preserved, but primarily consisted of bison with some beaver and canids.

Features and Activities. Several features were discovered during both the earlier and later excavations. Bone-filled pits, basin-shaped fire pits, the presence of fire-broken rock, burnt and unburnt bone fragments, and

potsherds with extensive carbon deposits indicate that secondary butchering, food processing and cooking were major activities. Although debitage and cores are present, tool production is believed to have been a minor activity because of the lack of hammerstones and anvils (Klimko & Hanna 1988:29), a curious interpretation in view of the high numbers of debitage found.

Radiocarbon Dates. Two radiocarbon dates were obtained: 1565±205 B.P. (A.D. 385 uncorrected) and A.D. 1425, which is considered too late for Avonlea (Klimko and Hanna 1988:30).

Larson Site (D10n-3)

Introduction. The Larson site (Figure 3) is a single component Avonlea campsite located on a terrace of the Ross Creek, thirty kilometres east of Medicine Hat in southeastern Alberta (Milne 1988).

Lithic Assemblage. Lithic artifacts included points, pièces esquilleés, endscrapers, bifaces, graver/perforators, a core, retouched flakes, and cobble choppers. Debitage consisted of 1130 specimens, primarily representing local quartzites, cherts, argillites, petrified wood, and quartz. Of the 22 projectile points, six were classified as Avonlea (four chert; one petrified wood; one chalcedony), 11 were Triangular points (10 chert; one quartzite), and five were fragments (five chert) (Milne 1988:56). Most stone

tools were manufactured from the same materials as the debitage but some Montana cherts were present along with one KRF point (Table 2).

Ceramics and Bone Tools. Five small ceramic body sherds were recovered, each exhibiting a smooth surface finish. In addition, several bone tools (awls and punches) were found during excavations.

Faunal Assemblage. Faunal remains were poorly preserved fragments and were primarily from large heavy ungulates, most likely bison. Also present were pronghorn antelope, dog, fox, duck bones, and foetal bison calf elements which suggest a mid-February date for site occupation (Milne 1988:55).

Features and Activities. Features discovered at the site include several roasting pits containing ash, fire-broken rock (FBR), flakes, burnt and unburnt bone fragments, charcoal and a few tools; a hearth; a stone boiling pit; and an excavated basin filled with fire-broken rock, unburnt bison bone, and lithic debitage. The features and artifacts recovered suggest that the major activities were food procurement and preparation, tool manufacture and repair, and hide preparation (Milne 1988:63). The concentration of tools and debitage adjacent to hearth features was interpreted as an indication of a winter occupation. In addition, Milne (1988:63) suggests the site was occupied by small groups of people who repeatedly returned to this locale

| | Debitage * | % | TOOLS ** Points | Endscrapers | Bifaces | Perforators | Pièces Esquillées | Cores | Retouched Flake Tools | Heavy Stone Tools | Total Lithic Frequency (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Quartzite | 525 | 46.5 | 1 | 1 | - | 2 | - | - | 2 | 14 | 45.0 |
| Chert | 524 | 46.4 | 19 | 4 | 3 | 2 | 7 | 1 | 14 | - | 47.6 |
| Argillite | 53 | 4.7 | - | - | - | 1 | 1 | - | - | 3 | 4.7 |
| Chalcedony | 15 | 1.3 | 1 | - | - | - | 2 | - | - | - | 1.5 |
| Pet. Wood | 8 | 0.7 | 1 | - | - | - | - | - | - | - | 0.7 |
| Quartz | 3 | 0.3 | - | - | - | - | - | - | - | - | 0.2 |
| Jasper | 2 | 0.2 | - | - | - | - | - | - | - | - | 0.2 |
| Totals | 1130 | 100.1 | 22 | 5 | 3 | 5 | 10 | 1 | 16 | 17 | 99.9 |

* Primarily local lithics with slightly less than 2% of non-local chert, chalcedony, and jasper flakes.

** Locally available quartzites, cherts, argillites and petrified wood for tools except for one Knife River Flint point.

Table 2. Larson Site Lithic Data (data from Milne 1988)

over a short time interval.

Radiocarbon Dates. Radiocarbon dates obtained place the occupation between A.D. 500 and A.D. 800 ( A.D. 530±150 and A.D. 785±125).

Manyfingers Site (DhPi-31)

Introduction. This site (Figure 3) is located in the Belly River valley in southwestern Alberta (Quigg 1988b). The Avonlea floor level contained extensive faunal remains, FBR (N=850), and limited lithic debitage (N=190), and few stone tools and ceramics.

Lithic Assemblage. Tools included 22 cobble choppers, five Avonlea points, three endscrapers, three bifaces, a uniface, several awls, and perforators. All the notched points were manufactured from non-local Montana and Avon cherts while the unnotched points were made from local materials (Quigg 1988b:72) (Table 3). Debitage primarily consisted of local green argillite, local quartzite, cherts, and chalcedony, and Swan River Chert, with few exotics (obsidian flake and several Montana and Avon cherts).

Ceramics and Bone Tools. This site provides further evidence that Avonlea is associated with ceramics as 13 potsherds exhibiting deep knotted cord impressions on their exterior surfaces were found (Quigg 1988b:78). Fourteen bone tools consisted of scrapers and fleshers.

Manyfingers Site Lithic Data (data from Quigg 1988b)

| | |
|---|---|
| Debitage n=190 | - dominated by local green argillite<br>- local quartzite, cherts, and chalcedony<br>- some non-local chert and chalcedony<br>- one obsidian flake<br>- no petrified wood, Avon chert, or Knife River Flint |
| Tools n=42 | - manufactured from local Swan River chert and non-local Montana and Avon Chert<br>- unnotched points made from local materials whereas notched points made from non-local Montana, Avon, and mountain cherts<br>- retouched flakes (n=9) made of local chert and argillite |

Yellowsky Site Lithic Data (data from Wilson-Meyer and Carlson 1985:29)

| Lithic Material | No. of Tools | No. of Debitage | Percent |
|---|---|---|---|
| Quartzite and Silicified Sandstone | 4 | 683 | 58.83 |
| Quartz | - | 245 | 21.10 |
| Cherts | 3 | 157 | 13.52 |
| Shale | - | 21 | 1.81 |
| Swan River Chert | 4 | 13 | 1.12 |
| South Sask. River Chalcedony | 4 | 26 | 2.24 |
| Altered Felsic Lava | - | 15 | 1.29 |
| Petrified Wood | 1 | 1 | .09 |
| Andesite | 1 | - | - |
| Totals | 17 | 1161 | 100.00 |

Table 3. Manyfingers site and Yellowsky site Lithic Data

Faunal Assemblage. Faunal remains (3567 items) consisted primarily of butchered bison bones with some dog, coyote, and rabbit.

Features and Activities. Features recovered included a concentration of bone, fire-broken rock, and flakes suggesting a refuse area, and a bone-lined basin-shaped pit surrounded by fire-broken rock, bone fragments, and flakes, for which the function is not known (Quigg 1988b:70). The features and artifacts recovered from this site all suggest that the excavations at Manyfingers sampled meat and food processing areas. Lack of foetal elements suggests a summer or fall site (Quigg 1988b:78).

Radiocarbon Dates. Radiocarbon dates (1075±90 B.P. or A.D. 875 and 1100±85 B.P. or A.D. 850) indicate an occupation at approximately A.D. 860 (Quigg 1988b:67).

## Henry Smith Site (24PH794)

Introduction. This multicomponent Avonlea bison kill (Figure 3) is located on the Milk River in northern Montana and consists of two effigies, several drive lines, a bison pound area, 21 rings, and six rock cairns (Ruebelmann 1988). Six discrete bone layers were discovered during excavations; however, Ruebelmann (1988:199) concluded that some mixing of the deposits had occurred.

Lithic Assemblage. Artifacts recovered during excavations included 256 points, most of which were Avonlea points with a few Prairie and Plains Side-Notched varieties, Triangular points, and one Besant point. Also, a large number of choppers, knives or cutting tools were found along with bone tools, cores, hammerstones, flake tools, anvils and bifaces.

Ceramics and Bone Tools. Three potsherds exhibit parallel grooves on their exterior surfaces. In addition, several bone tools were recovered.

Faunal Assemblage. Examination of bison dentition from the site (Wilson 1988) indicates that kills were conducted in winter, spring, and summer thus providing support for the model of year round kills developed by Arthur (1975).

Radiocarbon Dates. Radiocarbon dates indicate a time span of occupation from approximately A.D. 770 to A.D. 1040 (Ruebelmann 1988:201).

## North Saskatchewan Sites

Introduction. Avonela points, similar to those from the type site, were recovered from a number of sites in the southern edge of the Mixed-wood forest of Saskatchewan (Meyer et al. 1988).

Yellowsky Site. At the Yellowsky site (FjOd-2) in west-central Saskatchewan (Figure 3), the assemblage was dominated by debitage (N=1161) and

ceramics (N=1339).

Lithic Assemblage. The lithic assemblage, in addition to debitage, included a broken Avonlea Timber Ridge point, a drill, bifaces, endscrapers, retouched flakes, and large cobble tools (Wilson-Meyer and Carlson 1985). With regards to lithic use, there was extensive use of quartzites and silicified sandstones for large tools (Table 3). However, more than half of the artifact assemblage was manufactured from fine-grained materials not locally available (Wilson-Meyer and Carlson 1985:30).

Ceramics. Ceramics from the Yellowsky site conform to those associated with other Avonlea assemblages (Wilson-Meyer and Carlson 1985:28). The paste is hard and dense with local sand apparently being used as temper. Vessel form appears to be conoidal, with a slightly constricted orifice and no defined neck or shoulder. The lip form is unthickened to tapering and rounded to slightly flattened. Exteriors are net-impressed with some smoothing and decoration on some consisted of a single row of punctates on the rim below the lip. One vessel appears to be constructed by coiling.

Faunal Assemblage. Faunal bones consisted of bison, fish, dog, and other mammal remains, indicating the use of diverse faunal resources.

Features and Activities. Features at the site include a basin-shaped hearth, a concentration of debitage, and a surface hearth. The presence of

these features along with FBR, debitage, and evidence of ceramics manufacturing, all indicate that the site represents a short term occupation by a small group conducting both ceramic and tool manufacturing along with associated camp activities. The presence of burned canid remains in the basin-shaped hearth suggests possible ceremonial activities (Wilson-Meyer and Carlson 1985:31). With regards to seasonality, Wilson-Meyer and Carlson (1985:31) argue that the presence of fish and the evidence of on-site ceramics manufacture indicate a warm season occupation ranging from May to September.

Radiocarbon Dates. A radiocarbon date of 720±135 B.P. was obtained for site deposits, placing the Avonlea occupation relatively late, at about A.D. 1200.

Mineral Creek. At the Mineral Creek site (FhNc-53) (Figure 3), the assemblage contained Avonlea points associated with net-impressed pottery, while high numbers of debitage and the presence of hammerstones indicated that lithic reduction was a major activity (Meyer et al. 1988:36).

Gravel Pit. At the Gravel Pit site (FhNa-61) (Figure 3), the Avonlea assemblage departed from the norm. The occurrence of a Laurel vessel and adze blades, both characteristic of Middle Woodland Laurel forest-adapted peoples, provides evidence that these Avonlea peoples were interacting with

and being influenced by peoples of the Laurel culture (Meyer et al. 1988:39).

Discussion. The range of subsistence resources exploited by these northern Avonlea peoples is not yet well known, but species utilized included elk, bison, moose, beaver, waterfowl, and fish. Radiocarbon dates place occupation of these northern Avonlea sites from A.D. 900 to A.D. 1200 (Meyer et al. 1988). Meyer and others (1988:40) conclude that these Avonlea occupations of the southern forests most likely occurred during an open-water season (spring or summer) because of the presence of pottery which supposedly implies a warm weather activity. The lack of complete correspondence between ceramics of northern and southern Avonlea assemblages (the lack of parallel-grooved pottery from the forest areas) suggests that some cultural differentiation existed between these Avonlea peoples (Meyer et al 1988:41). It is possible that the northern Avonlea sites may be later in time than those occupations in the grasslands (Klimko 1985).

Lebret Site (EeMw-26)

Introduction. This site (Figure 3), a stratified multicomponent habitation site with an intense Avonlea occupation, is located in the Parklands of southeastern Saskatchewan on the valley bottom of the Qu'Appelle River (Smith and Walker 1988).

Lithic Assemblage. Artifacts recovered from the site include seven Avonlea

points, bifaces, and endscrapers. Lithics were primarily local, dominated by Swan River Chert, pebble cherts, silicified sediments, fine black chert, limestone chert, and white quartz. Three exotics were present; KRF, porcellanite, and Montana cherts; however, these occurred in small amounts (Table 4).

Ceramics. Ceramics recovered exhibited both net-impressed and smooth surfaces with faint parallel ridges, similar to those from the Garratt site (Morgan 1979).

Faunal Assemblage. The faunal assemblage was dominated by fish remains (located around a large ash-filled hearth) and waterfowl, with some deer, beaver, hare, otter, and very few bison elements.

Features and Activites. The tool and faunal assemblage indicates that the site was primarily used for manufacturing stone tools, hide working (as suggested by heavily worn scrapers), and as a spring or fall fishery location (Smith and Walker 1988). Smith and Walker (1988:88) suggest that this use of fish at Lebret was likely a regular activity of the northern Avonlea populations in their seasonal round. During the fall and spring in the Parkland, they would concentrate on fish resources, but with the coming of summer and the movement of bison out onto the grasslands they would follow the bison and conduct summer bison hunts.

Lebret Site Lithic Data (data from Smith & Walker 1988)

| | |
|---|---|
| Tools and Debitage | - local Swan River chert most common<br>- other local materials include pebble cherts, silicified sediments or fused shales, fine black chert, limestone chert, white quartz, granitic and basaltic cobbles, and ochre chunks<br>- also some non-local Knife River Flint, porcellanite, and Montana agate |

Fantasy Site Lithic Data (data from Tratebas & Johnson 1988)

LITHIC RAW MATERIAL-POINTS

| | Avonlea points | | Triangular points | |
|---|---|---|---|---|
| | N | % | N | % |
| Basalt* | 60 | 23.5 | 16 | 29.1 |
| Porcellanite* | 99 | 38.8 | 19 | 34.5 |
| Chert* | 62 | 24.3 | 18 | 32.7 |
| Knife River Flint | 5 | 2.0 | - | - |
| Chalcedony* | 17 | 6.7 | 2 | 3.6 |
| Petrified Wood | 4 | 1.6 | - | - |
| Quartzite | 4 | 1.6 | - | - |
| Psuedoquartzite** | 3 | 1.2 | - | - |
| Argillite | 1 | 0.4 | - | - |
| Totals | 255 | 100.1 | 55 | 99.9 |

*Primarily from local gravels
** Not defined

Table 4. Lebret and Fantasy sites Lithic Data

Radiocarbon Dates. A radiocarbon date for the Avonlea occupation placed it at 1260±115 B.P. or A.D. 690 (uncorrected; Smith and Walker 1988:82).

## Northern Montana Sites

Introduction. Three late Avonlea bison kill sites are located in the Milk River drainage in north-central Montana (Figure 3), the Fantasy site, Beaver Bend site, and the TRJ site (Tratebas and Johnson 1988). The sites which consist of kill, butchering and camp areas, with drive lines, bone beds, hearths, rings, and fire-broken rock concentrations, have undergone only preliminary testing surveys.

Lithic Assemblages. Artifacts recovered from the sites include both Avonlea notched and unnotched points. Tratebas and Johnson (1988:96) suggest possible functional differences between the two because unnotched points were more commonly found in the camp area than in the kill areas. Other artifacts include endscrapers, bifaces, retouched flakes, and preforms. At Beaver Bend, the presence of both Avonlea and Prairie/Plains Side-Notched points indicate at least two components at this kill site. At Fantasy (Table 4), the lithics used in the manufacture of points were primarily porcellanite, chert, basalt, and chalcedony with KRF and obsidian being rare (Tratebas and Johnson 1988:98).

Ceramics. Pottery exhibiting parallel grooved surfaces was recovered from both TRJ and Fantasy sites.

Radiocarbon Dates. A radiocarbon date from the Fantasy site of A.D. 930±100 suggests a relatively late date for Avonlea (Tratebas and Johnson 1988:91). Tratebas and Johnson (1988:100) conclude that these sites contain evidence of multiple activities conducted by the same or closely related people within a short time period as evidenced by the general homogeneity of the points and ceramics.

Lost Terrace site (24CH68)

Introduction. This site, also located in the High Plains of north-central Montana (Figure 3) provides evidence contradictory to the prevailing view of Avonlea peoples as semi-nomadic hunters of bison, using the bow and arrow and pounds (Davis and Fisher 1988). Lost Terrace is situated within the zone of maximum pronghorn abundance in western North America.

Lithic Assemblage. Artifacts recovered (Greiser 1988) consisted of 31 tools, 278 flakes, four pieces of shatter, and one core. The tools were dominated by projectile points, nine of which were Avonlea points. Lithics involved in manufacture of tools (Table 5) included primarily chert, jasper, chalcedony, quartzite, silicified sediments, obsidian, basalt, and porcellanite (Greiser

Lost Terrace Site Lithic Data (data from Greiser 1988)

| DEBITAGE * | N | % |
|---|---|---|
| Chert | 63 | 23 |
| Jasper/Silicified Wood | 34 | 12 |
| Chalcedony/Agate | 58 | 21 |
| Quartzite | 34 | 12 |
| Silicified Sediment | 15 | 5 |
| Obsidian | 45 | 15 |
| Basalt | 5 | |
| Porcellanite | 18 | }12 |
| Misc. silicates | 6 | |
| Totals | 278 | 100 |

* 29% of all debitage= non-local obsidian, basalt, silicified sediment, and porcellanite
71% of all debitage= local chert, quartzite, chalcedony, and jasper

TOOLS

| | Avonlea Pts N | Unnotched Bifaces N | Modified Flakes N | Modified Cobble N |
|---|---|---|---|---|
| Chert | 1 | 6 | 2 | 1 |
| Jasper | 2 | 1 | - | - |
| Chalcedony/ Agate | 1 | 4 | 3 | - |
| Quartzite | 2 | 1 | 1 | - |
| Silicified Sediment | 1 | - | - | - |
| Basalt | 2 | - | - | - |
| Porcellanite | - | 1 | 1 | - |
| Mudstone | - | 1 | - | - |
| Totals | 9 | 14 | 7 | 1 |

Table 5. Lost Terrace site Lithic Data

1988:120). The debitage was dominated by local cherts and chalcedony (50%) with some jasper and quartzite. Seventy-one percent of all flakes were made of these local raw materials while the remaining 29% were manufactured from non-local sources of obsidian, basalt, silicified sediments, and porcellanite (Greiser 1988). A large representation of thinning and resharpening flakes indicated that final stages of tool production and edge resharpening were common (Greiser 1988:126). The presence of heavy knife usage on unnotched bifaces and some points indicated that cutting was also a major activity at the site. Other artifacts included an arrow shaft abrader and a hammerstone.

Faunal Assemblage. The faunal assemblage was dominated by intensively utilized pronghorn remains along with some deer, bison, bird, and clam shells.

Features and Activites. A large midden was discovered, consisting of bone, teeth, FBR, charcoal, and artifacts, along with several excavated basin-shaped hearths.

Radiocarbon Dates. Radiocarbon dates from the site (1045 B.P. or A.D. 905±180, and 1110 B.P. or A.D. 840 ±100) point to occupation of Lost Terrace probably between A.D. 700 and A.D. 1000 or approximately A.D. 850 (Davis and Fisher 1988:109).

Discussion. Davis and Fisher (1988:113) conclude that at Lost Terrace, the Avonlea peoples utilized pronghorn due to extraordinary circumstances, most likely stress or extreme food shortage, provoking hunters to seek game they did not normally pursue in large quantities. Lost Terrace therefore represents the flexibility, resilience and survivability of Avonlea hunters, being only one expression of the total of Avonlea lifeways.

Benson's Butte-Beehive Complex

Introduction. Fredlund (1988) identifies several sites, south of the Yellowstone River in Montana with Avonlea-like points but very different subsistence and assemblage patterns from the "classic" Avonlea, as Benson's Butte-Beehive Complex. These sites are located on high bluffs, fortifiable locations and rockshelters and are characterized by circular rock-walled dwellings with central hearths.

Lithic Assemblage. A mixed assortment of projectile point types was found in artifact assemblages ranging from low side-notched Avonlea-like points to those with higher notches. The use of smoothed and rounded flake tools is common along with a large number and variety of bone and sandstone tools.

Ceramics. Little pottery is found associated with the sites.

Faunal Assemblage. Faunal remains were dominated by bison, bighorn sheep and antelope.

Radiocarbon Dates. Radiocarbon dates range from A.D. 400 to A.D. 1100 and Fredlund (1988:178) interprets this complex as a possible physical migration of people moving south from northern Montana and Canada around A.D. 400 into southern Montana, central and western Wyoming, north-western South Dakota, and northwestern Colorado.

## Manitoba Avonlea Sites

Introduction. Surface finds of Avonlea points have been found west of the Red River and north into the mixed woods area of Manitoba, but excavated Avonlea artifacts have only come from three sites: Avery, Stott, and Pas Reserve (Joyes 1988).

Avery. The Avery site (Figure 3) is a multicomponent campsite on the edge of the Aspen Parkland zone in southwestern Manitoba with Duncan-Hanna, Pelican Lake, Besant, Avonlea, and Blackduck and Selkirk components. Thirty-nine of 212 points were identified as Avonlea, two-thirds of which were made of KRF and the remainder of local cherts, porcellanite, and chalcedony. Pottery consisted of both parallel grooved and fabric-impressed surfaces. Other Avonlea artifacts included Plains Triangular points, split pebble endscrapers, and a faunal assemblage dominated by bison, with bird, fish,

and amphibian species. A fall or early winter occupation is postulated because of the absence of fetal or newborn bison elements.

Stott. The Stott site (Figure 3), an extensive camp and bison processing locality, produced artifacts characteristic of the Blackduck Phase with only a few Avonlea points. The high incidence of KRF and incising as a decorative mode on Blackduck pottery suggest possible contact with Plains groups (Joyes 1988:231).

Pas Reserve. The Avonlea assemblage at the Pas Reserve site (Figure 3) is very atypical (Joyes 1988:232) because it contains Blackduck pottery and has evidence of an emphasis on the hunting of muskrat and beaver, unlike the so-called "typical" Plains Avonlea with Saskatchewan Basin Complex ceramics and an emphasis on bison hunting.

Discussion. From the evidence presented by Joyes (1988), Avonlea appears to be poorly represented in Manitoba. Here, there is no Avonlea assemblage, fully comparable to those further west on the Plains (Joyes 1988:232). Instead the sites usually contain a mixture of Avonlea points with Blackduck artifacts. Joyes (1988:232) suggested one possible explanation for this ephemeral nature of Avonlea in Manitoba; the phase may have first become established in southern Alberta and not have reached Manitoba until later as suggested by radiocarbon dates from the Stott site (A.D. 840±60 and

975±150). A comparison of Avonlea Phase dates from the Saskatchewan Basin and those of Blackduck in Manitoba suggest to Joyes (1988) that these two cultures possibly co-existed in southern Manitoba for up to 400 years, between A.D. 700 and A.D. 1100, and interaction between the two took place primarily in southwestern Manitoba, in the mixed woods, and in the coniferous forest zone around the upper end of Lake Winnepegosis.

Discussion of the Avonlea Phase

The prevailing view of the Avonlea Phase peoples as semi-nomadic hunters of bison, located on the Northwestern Plains and using the bow and arrow along with bison traps and pounds must be seriously reconsidered. Recent discoveries of sites with Avonlea and Avonlea-like points have expanded both the geographic and temporal range of Avonlea. Assemblages containing Avonlea points have been found not only in the so-called core area of the Northwestern Plains, but also in the montane regions of Montana and British Columbia (Roll 1988), in Manitoba (Joyes 1988), in South Dakota (Hannus and Nowak 1988), in Wyoming (Frison 1988), south of the Yellowstone River in Montana (Fredlund 1988), in eastern Montana (Fraley 1988), in the Parklands (Smith and Walker 1988), and forest edge of Saskatchewan (Meyer et al. 1988).

Not only do Avonlea points have a widespread geographic distribution, but they are also associated with diverse subsistence strategies: the exploitation of fish, waterfowl, and small mammals in the Saskatchewan Parklands (Smith and Walker 1988); the use of elk, moose, bison, and beaver along the Saskatchewan forest edge (Meyer et al. 1988); the hunting of pronghorn in Montana (Davis and Fisher 1988); the utilization of bison and bighorn sheep south of the Yellowstone River (Fredlund 1988); and the exploitation of deer in the mountain areas of British Columbia and Montana (Roll 1988). These strategies are all in addition to or complementary to the exploitation of bison on the Plains (Milne 1988; Ruebelmann 1988; Quigg 1988b; Kehoe et al. 1988; Klimko and Hanna 1988).

The recent expansion of the Avonlea Phase, both temporally and geographically, and the realization of its diverse subsistence adaptations, all point to the need for a re-examination and reconsideration of the concept of Avonlea. To Roll (1988), we need a more rigorous use of classificatory systematics to deal with the diverse regional differences within the Avonlea Phase. Davis (1988:5) also argues that there must be a reconsideration of Avonlea as a transregional archaeological manifestation; a more formal, disciplined and systematic awareness of the ultimate behavioural reality of Avonlea is needed. Is the Avonlea Phase one culture, two, or more?

The major problem is that the presence of an Avonlea point in an assemblage immediately results in the assumption that an Avonlea Phase component is present (Roll 1988:244). The term "Avonlea", because of the widespread distribution of Avonlea points and the resultant diverse adaptive strategies, can mean different things and be interpreted differently by archaeologists. Therefore, a refinement of our taxomony or the creation of new nomenclature is needed (Roll 1988:247). We must realize that the Avonlea Phase is not a homogeneous culture which is uniform over the entire North American Plains area, but rather had regional adaptations and subsistences as well as temporal variations. The presence of an Avonlea point can therefore no longer be equated with bison-hunting and the use of the bow and arrow on the Plains, but must be examined within specific temporal and regional contexts.

## THE OLD WOMEN'S PHASE

### Distribution

The latter part of the Late Prehistoric period on the Northern Plains is known as the Old Women's Phase, or as Dyck (1983:126) refers to it, the Late

Side-Notched Series. The beginning of the Old Women's Phase appears in Alberta about 1400 B.P., with the earliest radiocarbon dates overlapping with Avonlea and Besant (Vickers 1986:95). The type site for this phase is the Old Women's Buffalo Jump located 90 km south of Calgary. It was excavated in the late 1950s (Forbis 1962) and on the basis of a sample of 521 points recovered from the Upper Pit, Forbis developed a point typology for the small side-notched points of Late Prehistoric age. He identified seven point types and ordered them chronologically from latest to earliest as follows: Washita, Pekisko, Paskapoo, Nanton, Lewis, Irvine, and High River points.

Early Old Women's sites are located over a large portion of the Alberta and Saskatchewan parklands and plains extending into northern Montana (Brumley and Dau 1988), but they are not found north of the parklands (Meyer 1988:59). Later Old Women's occupations have basically the same distribution except in Saskatchewan where they are primarily restricted to the western part of the province while the Mortlach Phase peoples occupied the majority of the Saskatchewan plains at this time (Meyer 1988:62-63).

Characteristics

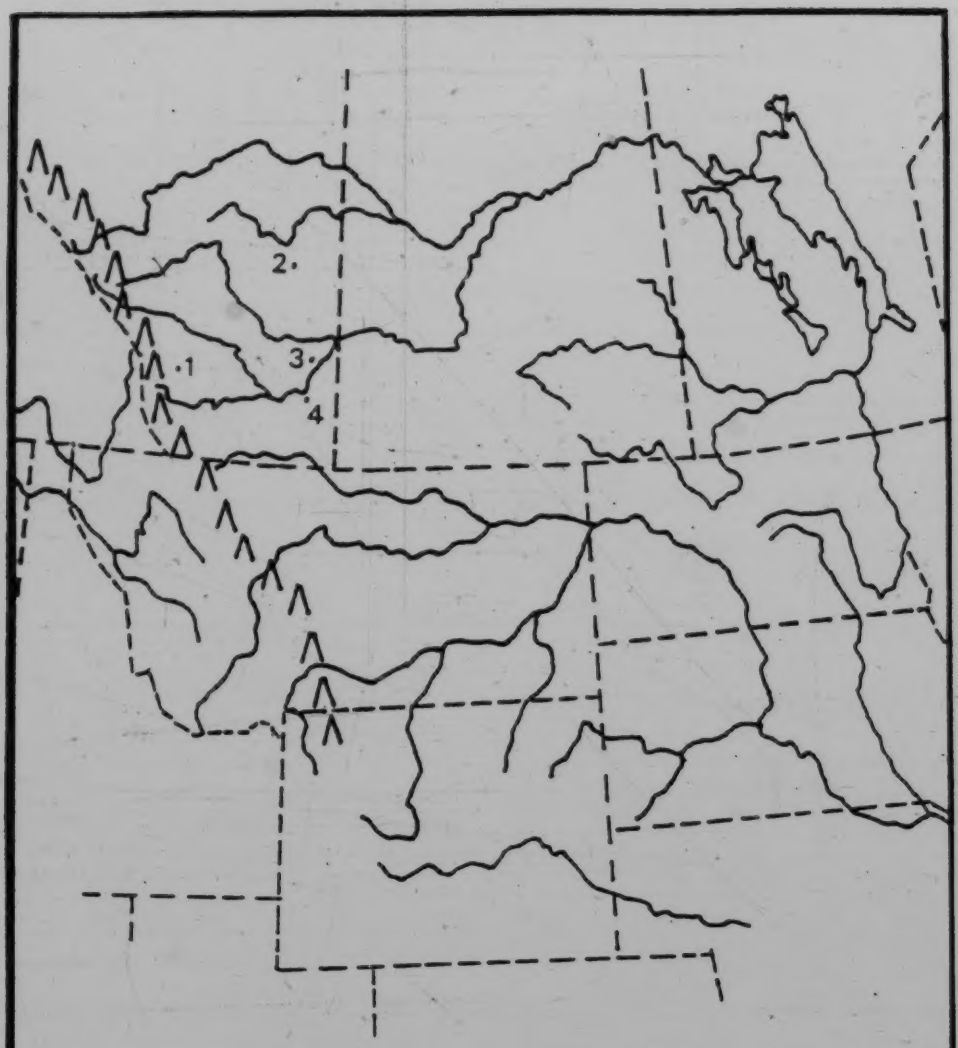
Projectile points associated with Old Women's assemblages include Prairie Side-Notched and Plains Side-Notched points (Vickers 1986:95).

Prairie Side-Notched points are characterized by poor quality flaking and lack of symmetry with wide shallow notches placed low on the blade. Plains Side-Notched points, on the other hand, exhibit well executed flaking with small deep notches placed relatively high on the blade (Kehoe 1966). Reeves (1983a:19) describes the Old Women's Phase as characterized by ceramics, an emphasis on local Plains or Montana lithics and extensive use of petrified wood, and a technology characterized by extensive use of split pebble techniques to produce blanks for endscrapers, points, pièces esquillées, and burin-like spalls. Old Women's ceramics appear to have not changed much through the history of the Old Women's Phase, although some decorative attributes from neighbouring ceramic assemblages were adopted (Meyer 1988:57).

## OLD WOMEN'S SITES

### Old Women's Buffalo Jump (EcPl-1)

Introduction. This site (Figure 4) is located on the south bank of Squaw Coulee, three kilometres northwest of the town of Cayley and 90 kilometres south of the city of Calgary (Forbis 1962). The site consists of low cliffs of




1. Old Women's Buffalo Jump
2. Lazy Dog Site
3. Ellis Site
4. Saamis Site

(modified from Klimko 1985:68)

Figure 4. Location of Old Women's Sites Described in Text

Paskapoo sandstone below which is an extensive fan-shaped deposit of bone, more than 30 metres wide and extending 60 metres downhill from the base of the cliffs to the bottom of the fan (Forbis 1962:57). Based on radiocarbon dates and the fact that no trade goods were recovered from the deposits, the site is believed to have been used continously and intensively for a period of over 1500 vears from A.D. 1 to A.D. 1600. Curiously, the Old Women's Buffalo Jump has no Avonlea component, despite its proximity to Head-Smashed-In Buffalo Jump which exhibits both Avonlea and Old Women's assemblages.

Stratigraphy. Two major units were excavated at the site: the Upper Pit and the Lower Pit. The Upper Pit, Upper Member includes layers 1 through 14 and yielded artifacts consisting of small projectile points, usually side-notched and presumably arrow points (Forbis 1962:74). The Lower Member of the Upper Pit includes layers 15 to 30 and produced large and heavy points, possibly representing dart points (Forbis 1962:74). The Upper Member consisted of mainly bone layers, and the Lower Member was composed primarily of "soil layers" (Forbis 1962:74). Because of the great accumulation of bone it is impossible to determine how many drives occurred at the jump and during which seasons they took place (Forbis 1962:77).

Lithic Assemblage. With regards to cultural materials, about 90% of the

artifacts recovered were projectile points. [It should be noted that Forbis' definition of "artifacts" includes all formed tools (for example, points, bifaces, retouched flakes, endscrapers) but does not take into consideration debitage quantities.] Forbis' (1962) analysis of the attributes and features of the points to determine changes through time revealed that most points from the Upper Member are side-notched, but in earlier layers, corner-notching was extremely common (Forbis 1962:93).

Forbis (1962) identified seven varieties of points from the Upper Member. Washita points from layers 1-4 are dated at approximately A.D. 1500 while Pekisko points, primarily from layers 1-4 but also found in layers 5-8, have an estimated beginning at A.D.1200. Paskapoo points, dated at A.D. 1000 are found in layers 1-10 but are more common in the upper layers. Nanton points from layers 1 through 14 are dated at A.D. 600-1700. Lewis points, common from layers 9 to 10, have an estimated date of A.D. 1100, with a possible range of A.D. 600-1600. Irvine points are most common in layers 9-14 and are roughly dated to A.D. 600-1200. Lastly, High River points are recovered from layers 11-14 with an estimated age range of A.D. 600-1350 (Figure 6).

With regards to raw materials, a wide range of materials were used in manufacturing Pekisko and Nanton points; unfortunately Forbis (1962:98-99)

| | Layers | Most Common Point | Estimated Age Range A.D. | Radiocarbon Dates |
|---|---|---|---|---|
| | | | 1700 | |
| | 1-4 | Washita<br>Pekisko | 1600 | |
| | | | 1500 | |
| | 5-6 | Paskapoo | 1400 | |
| | | | 1350 | |
| Upper Member | 7-8 | Nanton | 1300 | |
| | | | 1200 | |
| | 9-10 | Lewis<br>Irvine | 1100 | |
| | | | 1000 | |
| | 11-14 | Irvine<br>High River | 900 | A.D. 860±80<br>A.D. 940±80<br>(Layer 13) |
| | | | 600 | |
| | 15-22 | Besant and large dart point varieties | 300 | A.D. 310±60<br>(Layer 17) |
| Lower Member | | | 200 | |
| | 23-29 | | 100 | A.D. 120±70<br>(Layer 25) |

Figure 6. Upper Pit Stratigraphy, Old Women's Buffalo Jump (data from Forbis 1962)

provides no specific types. For Lewis points, the material was commonly quartzite in layers 9-10 and quartzite and a dull black stone in layers 11-14 (Forbis 1962:100). Irvine points in earlier layers were most often manufactured from a dull black stone (Forbis 1962:102).

Excavations of the Lower Pit revealed a similar distribution of projectile points to that from the Upper Pit (Forbis 1962:104). Late types consist of Washita, Peskisko, and Paskapoo, and occur in the top layers, while early types (Lewis, Irvine, and High River) occur in the lower layers.

Projectile points from the Lower Member of the Upper Pit consisted of several late Middle Prehistoric Besant points and other large dart points (Forbis 1962:109).

Other artifacts from the Upper Pit excavations include bifaces (n=9) made of chert, petrified wood, jasper, and obsidian; three endscrapers, one of which was made of basalt and poorly made suggesting that camp activities at the jump were negligible (Forbis 1962:115); bifacially chipped flakes (no quantities provided) which are limited to the Upper Member while unifacially chipped flakes (N=29) are scattered throughout both Upper and Lower Members; 17 choppers occurring sporadically from the surface to layer 26 and made of fieldstones, unifacially bevelled by percussion flaking at one end; and six hammerstones of quartzite and granite.

Ceramics and Bone Tools. Upper Pit excavations also produced one possible bone splinter awl and four pottery sherds from layer 5. The latter belong to the Ethridge ware type as described by A. Kehoe (1959) and similar to that from the Ross site (Forbis 1960) with exteriors which appear to be cord-roughened (Forbis 1962:119).

Radiocarbon Dates. Several radiocarbon dates were obtained for the Upper Pit at the site (Forbis 1962:81-82). Layer 13 was radiocarbon dated at 1100±80 B.P. (A.D. 860 ±80 ) and 1020 ±80 B.P. (A.D. 940±80) with an average of 1060 B.P. (A.D. 900). Layer 17, where Besant points were common, was radiocarbon dated at 1650±60 B.P. (A.D. 310±60) while layer 25 consisting of Pelican Lake-like points was radiocarbon dated to 1840 ±70 B.P. (A.D. 120 ±70). Based on these dates, Forbis (1962:83) provides age estimates for the various layers in the Upper Pit (Figure 6). In the Lower Member of the Upper Pit, layers 23-29 are dated at A.D. 100 while layers 15-22 are dated at A.D. 300. The boundary between the Upper and Lower Members is placed roughly at A.D. 600. Layers 11-14 of the Upper Member are placed at A.D. 900, while layers 9-10 are estimated at A.D. 110, layers 7-8 at A.D. 1300, layers 5-6 at A.D. 1400, and layers 1-4 terminating at A.D. 1600 because of the absence of trade goods at the site (Forbis 1962:82-83).

Lazy Dog Site (FbOr-57)

Introduction. This tipi ring site (Figure 4) is confined to a small saddle of an east-west ridge in the central portion of the Neutral Hills in the central-east Alberta Plains (Quigg 1978). The site consists of four distinct and well-defined tipi rings, five circular rock alignments, and four rock cairns (Quigg 1978:7).

Lithic Assemblage. Cultural material recovered from excavations consisted of 1550 stone pieces with finished tools comprising only 1.5% of the total (Quigg 1978:15). A single Prairie Side-Notched point manufactured from a brown chert was recovered during excavations along with five bifaces, five endscrapers, three unifacial knives, five marginally retouched flakes, three cobble choppers, and two anvil stones. No ceramics were found. Local lithics predominate (Table 6), especially the use of small chert and quartzite pebbles which account for 81.6% of all of the lithics (Quigg 1978:19). A high frequency of split pebbles and pièces esquillées indicates the use of the bipolar stone working technique.

Features and Activities. Fire-broken rock and lithic detritus distribution revealed that stone working and cooking activities were concentrated toward the centre of the site, outside of the tipi rings (Quigg 1978:28).

Radiocarbon Dates. A single radiocarbon date of 475±50 B.P. was obtained

Lazy Dog Site Lithic Data (data from Quigg 1978)

| | STONE FLAKAGE | |
|---|---|---|
| | N | % |
| Quartzite pebbles | 115 | 7.4 |
| Quartzite | 145 | 9.4 |
| Opalized Wood | 20 | 1.3 |
| Pebble cherts | 1153 | 74.3 |
| Chalcedony | 2 | 0.1 |
| Cherts | 114 | 7.5 |
| Obsidian | 1 | 0.1 |
| | n=1550 | |

| | Ret. flakes N | Uniface N | Point N | Bifaces N | Endscrapers N | Choppers N | Anvils N | Totals |
|---|---|---|---|---|---|---|---|---|
| Quartzite | | 2 | | 2 | | 2 | 2 | 8 |
| Opalized Wood | | | | | 1 | | | 1 |
| Pebble cherts | 4 | 1 | | 1 | 3 | | | 9 |
| Chalcedony | | | | | 1 | | | 1 |
| Cherts | 1 | | 1 | 2 | | | | 4 |
| Sandstone | | | | | | 1 | | 1 |
| Total | 5 | 3 | 1 | 5 | 5 | 3 | 2 | 24 |

Table 6. Lazy Dog site Lithic Data

along with an obsidian hydration date of A.D. 1373 (Quigg 1978:29). These dates, in addition to the Prairie Side-Notched point and lithic debitage recovered during excavations, provide evidence suggesting that the Lazy Dog site represents an Old Women's Phase occupation which served as a lithic working station (Quigg 1978:30). The lack of both ceramics and faunal material, and the lack of hearths and pits all suggest that the site was occupied for only a short period of time during a season which is as yet undetermined.

Ellis Site (EcOp-4)

Introduction. This site is a Late Prehistoric burial lodge/medicine wheel site located in southeastern Alberta on the Suffield Military Reserve (Figure 4), 31 kilometres north of Medicine Hat (Brumley 1985). It is located on a small isolated part of the flat prairie overlooking the valley of the south Saskatchewan River. It consists of a centrally situated medicine wheel composed of a stone circle from which radiate 10 to 11 stone lines. Adjacent to the medicine wheel are two stone cairns and 13 stone circles which by their size and configuration and associated cultural material suggest that they were tipi rings (Brumley 1985:192).

Cultural material recovered from excavations include human skeletal

remains which were found within the central portion of the medicine wheel, and several butchered bison bone fragments scattered among and near the base of the stones making up the ring of the medicine wheel. In addition, a partially decomposed painted and pointed wooden post was discovered near the centre of the medicine wheel, and is interpreted as representing a wooden tie-down stake used to secure a rope looped around the apex of the poles atop a lodge (Brumley 1985:223).

Lithic Assemblage. Other cultural materials (Table 7) include four projectile points (two identified as Irvine and Paskapoo, and two unidentifiable Late Prehistoric fragments), four bifaces, three endscrapers, 30 marginally retouched stone tools interpreted as simple knives used in slicing meat for cooking or drying, 11 cores of which all but one were of locally available material, 793 pieces of debitage, 23 fire-broken rocks, and fragments of red pigment from within the medicine wheel (Brumley 1985:196-204). No ceramics were recovered.

Features and Activities. The stone circles probably represent a series of short term occupations by small groups engaged in bison hunting, as the cultural material suggests an emphasis on food processing, tool manufacturing, and tool rejuvenation (Brumley 1985:205). According to Brumley (ibid.), the exposed location and lack of wood fuel in the immediate area suggests the

Ellis Site Lithic Data (data from Brumley 1985)

| TOOLS | NUMBER | COMMENTS |
|---|---|---|
| Points | 4 | |
| Bifaces | 4 | |
| Endscrapers | 3 | - local cherts |
| Marginally Retouched Stone Tools | 30 | - primarily local quartzites and Swan River cherts |
| Cores | 11 | -10 of local material<br>- 1 Banff chert |
| Debitage | 793 | - most of local raw materials |
| Total | 845 | |

Saamis Site Lithic Data (data from Milne-Brumley 1978)

FREQUENCY OF LITHIC TYPES BY WEIGHT

| | Points | Bifaces | Piéces Esquillées | Heavy Chipped Stone Tools |
|---|---|---|---|---|
| | % | % | % | % |
| Chert | 81.7 | 40.8 | 89.0 | 2.4 |
| Petrified Wood | 7.5 | 43.9 | 4.1 | - |
| Quartzite | 1.5 | 13.4 | - | 58.5 |
| Chalcedony | 3.1 | 0.6 | 2.3 | - |
| Obsidian | 4.2 | 0.9 | - | - |
| Siltstone | 2.0 | 0.4 | 4.7 | - |
| Argillite | - | - | - | 19.0 |
| Sandstone | - | - | - | 20.2 |
| Totals | 100.0 | 100.0 | 100.1 | 100.1 |

Table 7. Ellis site and Saamis site Lithic Data

site was most likely occupied during mid-spring to late summer or early fall. The structural characteristics of the spatially associated medicine wheel, stone circles and cairns suggest that the features were not all comtemporaneous but represent an unknown number of temporally separate events (Brumley 1985:204). This is suggested by things such as scavenging of some rings in order to construct the medicine wheel spokes.

Radiocarbon Dates. The projectile points along with a radiocarbon date of A.D. 1430±160 (450 ±160 B.P.) from the wooden post suggest a site occupation during the post-Avonlea period. Brumley (1985:205) believes that the medicine wheel, human remains, pigment, and wooden post are most likely contemporary and date to A.D. 1430 ±160 (Brumley 1985:205). The similarities between the Ellis medicine wheel and ethnographic accounts of Blackfoot memorials to warrior chiefs and Plains Indian death lodges suggest that the centrai ring of the Medicine wheel is a tipi ring while the stone spokes were attached as a mark of respect and honour to indicate the deceased was a renowned warrior (Brumley 1985:223).

Saamis Site (EaOp-6)

Introduction. The Saamis site is an extensive camp and butchering station located on two stream terraces of the Seven Persons Creek (Figure 4),

upstream from where it enters the South Saskatchewan River valley in the city of Medicine Hat (Milne-Brumley 1978). Milne-Brumley (1978) divided the site into four areas. Areas A and D are campsite locations as indicated by the presence of fire-broken rock, hearths, points, endscrapers, and pottery sherds. Area B consisted of several features of piles of bison bone, rock-filled basin hearths, bone-filled depressions, ash-filled basin hearths, and a single stone pile. Area C, which consisted of a layer of butchered bison bone and an ash-filled depression along with several stone tools, most likely functioned as a butchering and meat processing area as indicated by the numerous articulated and disarticulated butchered elements (Milne-Brumley 1978:20).

Lithic Assemblage. In addition to bone, other cultural material recovered from excavations include projectile points (Plains and Prairie Side-Notched and Plains triangular being the most abundant), endscrapers, bifacial knives, perforating tools, pièces esquillées made from small pebble cherts, cores, hammerstones, heavy chipped stone tools, and a small sample of bone tools. With regards to raw materials for tool manufacturing, local lithic resources were most commonly used: cherts from river gravel, petrified wood from local glacial deposits, red shale from cliffs near Redcliff near Medicine Hat, and cobbles of argillite, quartzite, and sandstone from stream bed deposits (Table 7). Shell from local river clams was also used (Milne-Brumley 1978).

Ceramics. Ceramics recovered from excavations are mostly of the Saskatchewan Basin Complex variety (N=451) while a few are from the Cluny Complex (N=10; Milne-Brumley 1978:109-124). The most numerous Saskatchewan Basin ceramic types are classified as Late Variant forms as originally defined by Byrne (1973): Truncated Cord Marked (N=182) which are characterized by the presence of cord-wrapped paddle impressions which have been partially smoothed producing shallow vertical parallel grooves, and Thick Smoothed sherds (N=127) with generally smooth exterior surfaces. Other Saskatchewan Basin ceramic types include Truncated Fabric/Net Impressed (N=55) characterized by a generally pitted surface which has been subsequently smoothed; Fingertip Impressed (N=44) with dimpled smoothed surface finish; Cord Marked (N=23) characterized by exterior surfaces impressed with a cord-wrapped paddle; and Thin Smoothed ceramics with smoothed exterior surfaces.

Faunal Assemblage. Animal resources utilized at the site include bison, black bear, wolf, fox, eagle, deer, antelope, and hare.

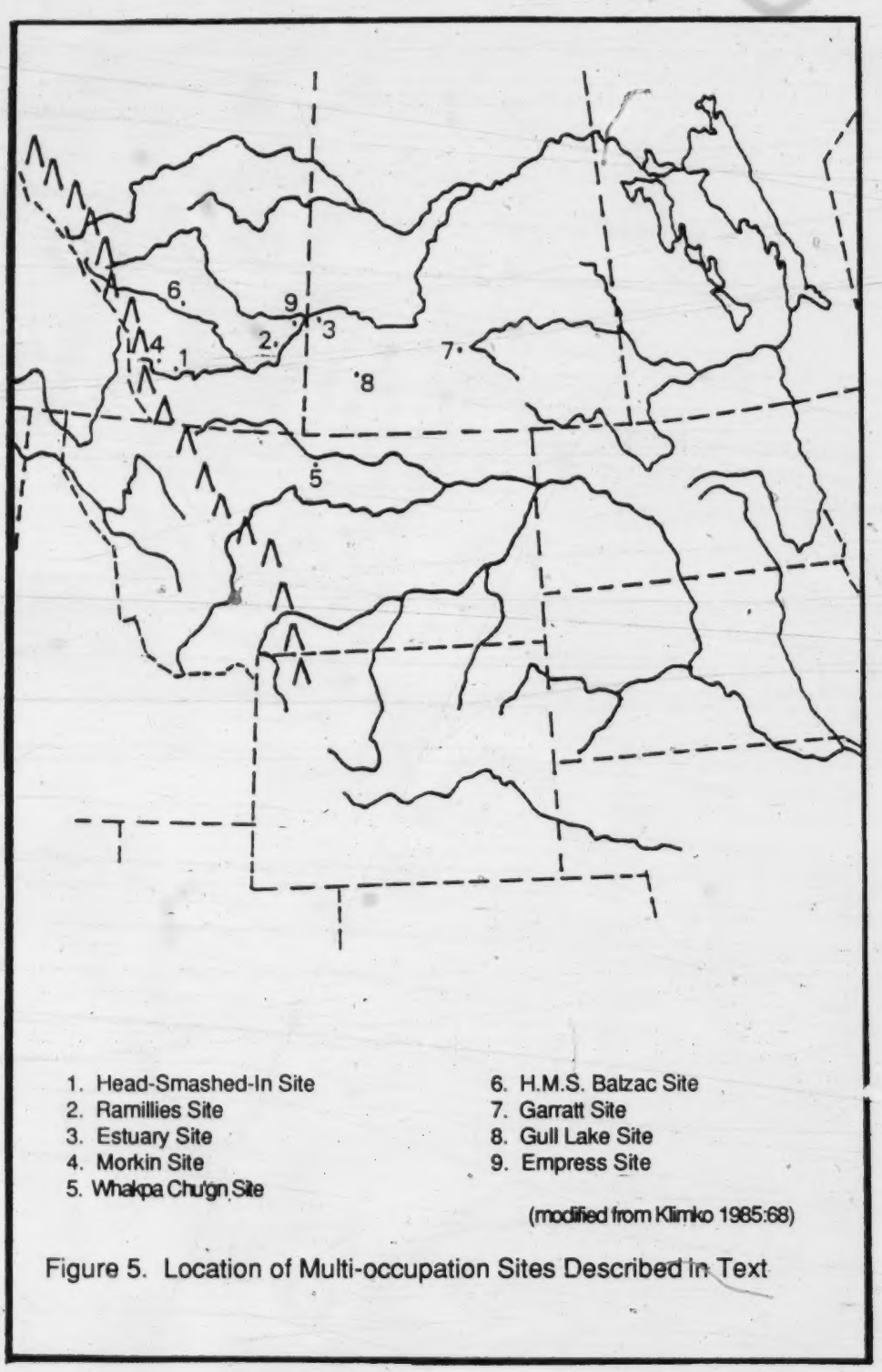
Features and Activites. The dense quantities of butchered bison remains, evidence of butchering, meat processing, and flintknapping, all suggest that the site inhabitants were using an as yet unlocated communal bison kill area in the vicinity, and that Saamis represents an aggregation of people who

came together to carry out a bison hunt (Milne-Brumley 1978:140). The site was possibly occupied either late winter or early spring as suggested by the presence of foetal bison bone and a concentration of activities around hearth areas (Milne-Brumley 1978:136,139).

Radiocarbon Dates. Typologically, the site suggests occupation in the Late Prehistoric, Protohistoric and Early Historic periods. Three radiocarbon dates of A.D. 1865 ±70, A.D. 1515 ±125, and A.D. 1740 ±80 indicate a series of occupations dominated by Old Women's complex peoples (Milne-Brumley 1978:35). Milne-Brumley (1978:35) concludes that the initial occupation at Saamis is between A.D. 1390 and A.D. 1640 and terminal occupations are between A.D. 1660 and A.D. 1820. Charts comparing the frequency of Late Plains points show a close affinity between Saamis occupations and those from layers 1-4 at Old Women's Buffalo Jump near Cayley, Alberta, where layers 1 to 4 are estimated at A.D. 1600-1700 (Forbis 1962).

## MULTI-OCCUPATION SITES

In addition to the sites with either Avonlea or Old Women's Phase traits, there are several sites located on the Plains (Figure 5) that exhibit characteristics of




1. Head-Smashed-In Site
2. Ramillies Site
3. Estuary Site
4. Morkin Site
5. Whakpa Chu'gn Site
6. H.M.S. Batzac Site
7. Garratt Site
8. Gull Lake Site
9. Empress Site

(modified from Klimko 1985:68)

Figure 5. Location of Multi-occupation Sites Described in Text

both the Avonlea and Old Women's complexes and these most often suggest a transitional relationship between the two phases rather than a distinct cultural break.

Empress Site (Ef0o130)

Introduction. The Empress site (Reeves 1977; Hudecek 1988) is a Late Prehistoric tipi ring site located in southeastern Alberta (Figure 5), whose assemblage contains attributes of both Avonlea and Old Women's Phases. This suggests that it was occupied during a period of culture change which is thought to represent a transition between the two phases. It consists of eight tipi rings and one stone cairn, and is located on a terrace overlooking the Red Deer River.

Lithic Assemblage. Cultural materials recovered from the Empress site include projectile points, bifaces, retouched flakes, endscrapers, pièces esquilleés, retouched spalls, hammerstones, anvils, debitage, and ceramics. The projectile points recovered during excavations consist of 28 Plains Triangular points, 11 Avonlea Timber Ridge Side-Notched points, and six Prairie Side-Notched points. With regards to lithics (Table 8), the inhabitants of the Empress site relied heavily on local lithic resources found in river gravel and glacial tills of the area, predominately chert pebbles (particularly

Balzac Site Lithic Data (data from Head 1985)

| TOOLS | | % |
|---|---|---|
| Cherts | approx. | 50 |
| Siltstones | | 25 |
| Quartzites | | 10 |
| Silicified Wood | | 10 |
| Obsidian*, Quartz Crystal*, misc. | | 5 |

*Non-local

| | Quartzite | Obsidian | Quartz Crystal | Silicified Wood |
|---|---|---|---|---|
| Avonlea | 10-28% of tools | low frequency | present | low frequency |
| Old Women's | <10% of tools | heavy use | low frequency | heavy use |

Empress Site Lithic Data (data from Hudecek 1988)

Frequency by Number

| | Tools (including Points) % | Debitage % |
|---|---|---|
| Cherts | 68.2 | 68.0 |
| Quartzite | 6.6 | 15.2 |
| Petrified Wood | 10.3 | 4.8 |
| Silicified Sediments | 8.2 | 5.1 |
| Non-silicified Sediments | 2.1 | 2.4 |
| Chalcedony | 1.5 | 1.4 |
| Knife River Flint | 0.7 | 0.5 |
| Misc. | 2.4 | 2.6 |
| Totals | 100.0 | 100.0 |

Table 8. Balzac site and Empress site Lithic Data

Swan River Cherts), quartzite pebbles and cobbles, and petrified wood (Hudecek 1988). Non-local materials include a few KRF and obsidian flakes. The large quantity of debitage, the availability of lithic resources in the Empress site area, the evidence of heat treatment, and the presence of several hammerstones and anvils all suggest that stone tool manufacturing was an important activity at the Empress site (Hudecek 1988). With regards to lithic technology, the most prominent at the Empress site is the split pebble technology. Using bipolar percussion, pebble spalls were removed from chert pebbles and used as blanks to produce pièces esquilleés, endscrapers, retouched flakes, and projectile points.

Ceramics. Thirty-seven pottery sherds were recovered from the site, the majority exhibiting smooth exterior surfaces while four sherds are characterized by fabric/net impressed surfaces as defined by Byrne (1973).

Features and Activites. In addition to the several basin-shaped hearths, there were several excavated pits containing ash, charcoal, bison bone fragments, debitage, and fire-broken rock. The evidence of heavily fragmented and burned bone indicates that butchering and meat processing activities were occurring in addition to lithic stone tool manufacturing. Also, the large amounts of small unburned bone chips that were found indicate boiling of bone for bone-grease preparation.

The Empress site most likely represents a small transitory camp occupied for a relatively short period of time. The spacing and configuration of the rings suggest a camp pattern. The presence of several large cobble-surrounded hearths, and the concentration of artifacts inside the rings and around central hearths indicates that activities were clustered around these features and suggests that the site was possibly a winter occupation (Hudecek 1988).

Discussion. Based on the sample of projectile points (both Avonlea and Old Women's points) and ceramics recovered from the site, it is clear that the eight rings found at Empress relate to the same cultural period, that of the Late Prehistoric. Moreover, evidence of different occupations suggests multiple re-use of the site. For example, the cultural levels of most of the rings occur at approximately 10 to 25 cm below the surface; however, hearth one in Ring One occurs near the surface suggesting re-occupation of this feature. Multiple occupations are also indicated by Rings Four and Seven which are slightly scattered, suggesting scavenging by later occupants. At the same time, all the Empress rings are relatively similar in size, with similar features and artifact content. It therefore seems reasonable to conclude that the Empress site represents an encampment which was used repeatedly over a relatively short time span during a change from Avonlea to Old Women's

projectile points.

However, as Binford (1982:16) argues, there is not a necessary relationship between depositional episodes and occupational episodes. Associated items, to Binford, may never have occurred together as an organized body of material during any given occupation (Binford 1982:17-18). This means that the Empress site could have been occupied by two different cultural groups, the makers of Avonlea and Old Women's projectile point types, which were co-existing on the Plains at approximately the same time.

Head-Smashed-In Buffalo Jump (DkPj-1)

Introduction. Head-Smashed-In, located in southwestern Alberta on the southeastern edge of the Porcupine Hills (Figure 5), is an excellent example of a site which has both Avonlea and Old Women's occupational levels (Reeves 1978; Brink et al. 1985; Reeves 1983b). The site consists of a kill area, campsite and processing area, and a gathering basin.

Lithic Assemblage. The Avonlea Phase (A.D. 100-300 to A.D. 850) is represented by thick bone beds indicating massive and frequent bison drives (Reeves 1978:165). This assemblage is dominated by Avonlea points, especially the Timber Ridge Side-Notched variety, the same type found at the

Empress site. Occasional atlatl points and stemmed arrow points occur in the lowest Avonlea components while Plains Side-Notched forms are present in the latest Avonlea drives. Other items include bifaces, endscrapers, pièces ésquillees, retouched chert flakes, chert debitage, cobbles and flake choppers, anvils and hammers.

The Old Women's Phase (A.D. 850-1850) at Head-Smashed-In, located stratigraphically above Avonlea deposits, is also represented by massive, successive bison kills and large areas of charred and calcined bone. The assemblage is dominated by projectile points of the Plains side-Notched system while in the lower levels, Prairie Side-Notched points of the Early Old Women's Phase occur with the occasional Timber Ridge Side-Notched point of the late Avonlea Phase (Reeves 1978:166). Other items include small bifaces, endscrapers, pièces esquillées, retouched chert flakes and debitage, cobble and flake choppers, hammers and anvils. A horizon of tools made of petrified wood is also present during Old Women's occupations and Reeves (1978:166) argues that this horizon occurs as a discrete unit in many jumps and campsites in the area.

With the advent of the Avonlea Phase there begins a trend towards use of cryptocrystalline raw material and by the Old Women's Phase, there is a decided emphasis on cryptocrystalline technology. According to Reeves

(1978:165), the Avonlea lithic suite at Head-Smashed-In consists primarily of cherts from Montana and the Canadian Rockies (Table 9). With regards to Old Women's raw material use, several of the lithics used in Avonlea assemblages are lacking in Old Women's deposits, but unfortunately Reeves (1978:166) provides no details.

Reeves (1978) also identifies several assemblage trends at Head-Smashed-In. Bifaces are often discarded during Avonlea and Old Women's Phases whereas in levels associated with the Pelican Lake and Mummy Cave complexes, there is a distinct lack of bifaces with the presence of biface resharpening flakes suggesting they were retrieved rather than discarded (Reeves 1978:166). I presume Reeves means that the bifaces were brought into the site, used, retrieved, reworked, and then carried elsewhere. Pièces esquillées are characteristic of the Late Prehistoric phases beginning in the late Avonlea through to Old Women's occupations. This pattern is also found in nearby campsites reflecting what Reeves (1978:166) refers to as a general technological change.

Retouched/utilized flakes are absent in earlier levels whereas during the Late Prehistoric period, they become more common (Reeves 1978:166). Reeves (1978:168) also identified trends in the general lithic technology of the site. Beginning with the Mummy Cave occupations, the most generalized,

Head-Smashed-In Site Lithic Data

| | |
|---|---|
| Avonlea | - chert debitage and flakes common<br>- Avonlea lithic suite dominated by cherts from Montana and Canadian Rockies |
| Old Women's | - chert debitage and flakes common<br>- petrified wood tools<br>- lacks many of the Avonlea lithics |

(data from Reeves 1978)

DEBITAGE (Processing area- data from Brink et al 1985)

| | % |
|---|---|
| Chert | 42.9 |
| Chalcedony | 17.7 |
| Quartzite | 18.6 |
| Silicified Siltstone | 5.5 |
| Petrified Wood | 3.3 |
| Silicified Mudstone | 2.7 |
| Siltstone | 2.2 |
| Sandstone | 2.0 |
| Obsidian | 1.9 |
| Quartz | 1.4 |
| Misc. | 1.5 |
| Totals | 99.7 |

POINTS (data from Brink et al. 1985)

| | Avonlea N | Samantha & Prairie Side-Notched N | Plains Side-Notched N |
|---|---|---|---|
| Chert/Chalcedony (includes 2 Swan River and1 KRF) | 11 | 15 | 8 |
| Silicified Wood | - | 4 | 2 |
| Silcified Sediment | - | 6 | 1 |
| Porcellanite | 1 | 1 | - |
| Mudstone | - | 1 | - |
| Totals | 12 | 27 | 11 |

Table 9. Head-Smashed-In site Lithic Data

few formed tools are found with emphasis on the use of microcrystalline flakes for butchering. By the Pelican Lake levels, there appears a trend toward the discarding of more specialized formed tools such as bifaces, but there is still an emphasis on generalized microcrystalline debitage for all-purpose tools. With the Avonlea Phase, emphasis switches to the use of formed small tools, bifaces, pièces esquillées, and chert flakes. Microcrystalline flakes are less important but still used. By the Old Women's occupation, emphasis is on formed small tools and cryptocrystalline technology (bifaces, pièces esquiliées, retouched chert flakes) with few microcrystalline flakes (Reeves 1978:168).

Ceramics. Ceramics have been recovered within the camp/processing area of Head-Smashed-In and include cord-wrapped stick impressed rimsherds, fabric impressed rim and body sherds, truncated cord marked sherds, and horizontal dentate stamped sherds, all being of the Saskatchewan Basin Ceramic Complex or Cluny Complex types (Brink et al. 1985:213-215).

Seasonality. With regards to seasonality, studies at Head-Smashed-In, suggest the site was used during the fall and winter (Brink et al. 1985:252). Brink and others (1985) suggest that throughout the winter, the inhabitants of winter valley sites along Pincher Creek would occasionally move up to the coulees and Head-Smashed-In to conduct communal kills. However, bone

recovered from the processing area was poorly preserved and the sample of mandibles was too small to be used as a seasonal indicator (Brink et al. 1985:254). Analysis of Head-Smashed-In fauna from Reeves' earlier excavations of the kill site suggests fall kills were most common but other seasons were represented (Lifeways 1979).

Radiocarbon Dates. Several radiocarbon dates were obtained from site deposits. Old Women's dates include A.D. 1250±170 and A.D. 760±90. Avonlea dates include A.D. 950±110, A.D. 910±140, A.D. 90±120, A.D. 305±130, and A.D. 110±90 (Reeves 1978:162).

Discussion. According to Reeves (1983a:16), excavations at Head-Smashed-In conducted in 1972 to clarify Avonlea/Old Women's transition revealed a gradual change rather than replacement.

Recent excavations in the bison processing area at Head-Smashed-In have revealed stratified Avonlea and Old Women's deposits (Dawe, pers. comm. 1989). Layers 3 and 4 contain characteristic Avonlea tools and are separated from the upper Old Women's levels (layer 1 and 2) by a sterile layer of sand. Radiocarbon dates of soil samples fall into the expected ranges of Avonlea and Old Women's. Preliminary analysis has revealed several major trends. Avonlea assemblages are dominated by approximately equal amounts of Swan River Chert and other cherts whereas in Old

Women's assemblages, a decrease in the relative amount of Swan River Chert and a corresponding increase in other cherts occurs along with a very slight increase in exotic lithics such as obsidian, KRF, and porcellanite. In addition, the bipolar technology appears to be more common during the Old Women's occupations.

Ramillies Site (EcOr-35)

Introduction. The Ramillies site (Figure 5) is a multi-occupational communal bison kill and campsite situated along the edge of and within a large coulee originally formed as a glacial outwash channel located in the short grass plains of southeastern Alberta, north of Medicine Hat (Brumley 1976a). The major period of site occupation occurred between A.D. 150-965 by prehistoric groups representative of Avonlea and Old Women's Phases (Brumley 1976a). The site consists of a bison pound, an enlarged and modified natural, oval-shaped depression located on the edge of the prairie; three stone drive lanes; a campsite of nine tipi rings to the south of the pound; and three stone cairns. Excavations at the site indicated that the depression started out as a small natural glacial ice recessional feature which was then modified by hunters with an earth and stone wall (2 m high) constructed so as to enclose the north side of the depression thereby making an effective trap

for bison. Only small amounts of bone and cultural material were recovered within this depression. However, on the slope of the coulee wall below the depression, an extensive midden of bison bone was discovered, containing several projectile points (Brumley 1976a). This bone midden is interpreted as reflecting repeated use and cleaning of the bison pound structure (Brumley 1976a).

Lithic Assemblage. The 32 Avonlea points recovered from Ramillies are all of the Timber Ridge Side-Notched variety while the Old Women's points are of the Nanton, Paskapoo, Lewis, Irvine, High River, and Plains Triangular types. Other items recovered included bifaces, retouched flake tools, endscrapers, spokeshaves, burin, pièces esquillées, large core tools and a large number of bone tools.

Tools and debitage recovered from the site suggest virtually complete reliance on local lithic sources (Table 10) for stone tool production (Brumley 1976a:55). Cherts, petrified wood, quartzite, granite, limestone, and argillite, all heavily utilized at the site throughout both Avonlea and Old Women's occupations, are available from local bedrock and glacial deposits and river gravels. The only evidence for use of non-local sources included obsidian (Yellowstone area), KRF (eastern North Dakota), and silicified siltstone (southern Montana, or northeastern Wyoming ) (Brumley 1976a:55).

| | Avonlea Pts. | Nanton Pts. | Paskapoo Pts. | Lewis Pts. | Irvine Pts. | High River Pts. | Stemmed Pts. | Avonlea Triang. Pts. | Plains Triang. Pts. | Unclass. fragments | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Chert | 32 | 19 | 2 | 2 | - | - | - | 4 | 6 | 12 | 77 |
| Pet. Wood | - | 3 | 2 | - | 1 | 1 | 1 | - | - | - | 8 |
| KRF | - | 2 | - | 1 | - | - | - | - | - | 2 | 5 |
| Quartzite | - | -- | - | - | - | - | - | - | 1 | - | 1 |
| Sil. Siltstone | - | - | - | - | - | - | - | - | - | 1 | 1 |
| Totals | 32 | 24 | 4 | 3 | 1 | 1 | 1 | 4 | 7 | 15 | 92 |

Ramillies Site Point Data (data from Brumley 1976a).

FREQUENCY OF RAW MATERIALS IN DEBITAGE

| | N | Weight (g) |
|---|---|---|
| Chert | 189 | 607.5 |
| Pet. Wood | 59 | 134.3 |
| KRF | 2 | 1.9 |
| Sil. Siltstone | 1 | 0.3 |
| Quartzite | 114 | 1685.0 |
| Limestone | 5 | 55.8 |
| Totals | 370 | 2484.8 |

Table 10. Ramillies Site Lithic Data (data from Brumley 1976a)

| | Bifaces | Ret. Flake Tools | Endscrapers | Spokeshaves | Gravers | Burins | Pièces Esquillées | Pebble Core Tools | Heavy Chipped Stone Tools |
|---|---|---|---|---|---|---|---|---|---|
| Chert | 4 | 29 | 9 | 1 | 1 | 2 | 20 | 1 | - |
| Pet. Wood | 6 | 12 | - | - | - | - | - | - | - |
| KRF | - | - | 2 | - | - | - | - | - | - |
| Silicified Siltstone | - | 1 | - | - | - | - | - | - | - |
| Quartzite | 2 | 9 | 1 | 1 | - | - | 1 | 3 | 3 |
| Argillite | - | 2 | - | - | - | - | 1 | - | - |
| Obsidian | - | 1 | - | - | - | - | - | - | - |
| Granite | - | - | - | - | - | - | - | - | 2 |
| Totals | 12 | 54 | 12 | 2 | 1 | 2 | 22 | 4 | 5 |

Frequency of Raw Material in Stone Tools.

Table 10 (cont'd). Ramillies Site Lithic Data (data from Brumley 1976a)

Ceramics and Bone Tools. Forty pieces of pottery were also recovered, all exhibiting a smooth surface except for one rim sherd which was decorated on its lip with a cord-wrapped rod. The ceramics were recovered primarily from Area B (Brumley 1976a:74) which exhibited no apparent stratigraphy and where both Avonlea and Old Women's point types were found together. Brumley (1976a:61) concludes that Area B materials thus reflect a mixture of cultural materials used by both Avonlea and Old Women's peoples, this mixture being the result of downslope movement and redeposition. The bone tools exhibit polished surfaces and broken edges that have been rounded and polished by use. These were possibly used in butchering and hide working activities (Brumley 1976a:56).

Faunal Assemblage. The faunal assemblage from all three areas of the site (A,B,C) was composed almost exclusively of bison elements with a few post-cranial elements from dog or coyote (Brumley 1976a:19-20).

Features and Activities. Evidence of basin-shaped hearths; excavated pits containing ash, charcoal and bison bone fragments; debitage; and FBR were also discovered at Ramillies (Brumley 1976a). Because Ramillies is situated a considerable distance from protected wooded areas which usually served as winter camp locales, it is highly unlikely that Ramillies was used during the winter or early spring. Rather, the presence of foetal and newborn bison

bones and dental eruption and wear, all indicate that Ramillies was utilized during spring, summer, and fall (Brumley 1976a:20).

Stratigraphy and Radiocarbon Dates. In area A at Ramillies, the secondary processing locale, Brumley (1976a) identified three occupations. Occupation III contains only Avonlea points. Occupation II contains both Avonlea and Old Women's points thus suggesting to Brumley (1976a:60) a transitional episode between the two; however, occupation II is bifurcated in places indicating mixing of the materials was possible, and thus it may actually represent two separate episodes (Brumley 1976a). Occupation I in Area A contains only Old Women's Phase point types.

In area C, the undulating prairie region containing the nine rings and three cairns south of the pound at Ramillies, two occupations were identified by Brumley (1976a). Occupation II yielded mostly Old Women's points although the presence of one Avonlea point suggests several uses of the pound by both Avonlea and Old Women's peoples; a radiocarbon date of A.D. 985±65 was obtained (Brumely 1976a:61). Occupation I produced no artifacts but a radiocarbon date of A.D. 1290±115 suggests light use during the Old Women's Phase (Brumley 1976a:62).

Estuary Bison Pound (EfOk-16)

Introduction. This site is located at the head of a large coulee on the south bank of the South Saskatchewan River (Figure 5) below its confluence with the Red Deer River in southwestern Saskatchewan (Adams 1977). It has two major occupational levels: level I represents Old Women's Phase occupation and Level II has both Old Women's and Avonlea Phase material. According to Adams, radiocarbon dates suggest there is only 110 to 200 years between these two occupation levels. Level I contains the essential character of level II including artifact forms, lithic industry, hearth style, and butchering practises, but lacks Avonlea points, and this provides evidence pointing towards a transition between the two phases (Adams 1977).

Level II

Lithic Assemblage. This level contains both Avonlea (N=31) and Old Women's (N=22 Prairie Side-Notched) points, small formed bifaces, and reveals a reliance on local lithics (Adams 1977:143). Adams (1977:143) argues for the presence of the standard Plains Indian tool kit: scrapers, pièces esquillées, hammerstones, cobble choppers, mauls, endscrapers, drills and awls.

Ceramics and Bone Tools. Two ceramic sherds were recovered, both exhibiting cord-marked grooves on their exterior surfaces. Also present were

118 bone tools, including bone awls, flakers, knapping tools, and scrapers, made especially of ribs which exhibited great polish and wear.

Features and Activities. Activities during level II occupation include bison capturing as indicated by the presence of a bone bed and a post-hole configuration suggesting a pound structure; butchering and food preparation as suggested by the presence of both flat and basin-shaped hearths; lithic tool production indicated by debitage concentrations; and possibly ceremonial activities as suggested by the presence of several postholes forming a semi-circular pattern (Adams 1977). As Adams (1977:97) notes, there appears to be more diversified features in Level II than in Level I.

Radiocarbon Dates. Level II, representing both Avonlea and Old Women's Phases, is radiocarbon dated at 1190±165 B.P., or A.D. 760 ±165, during a time when the pound was used at least three times in rapid succession as suggested by three separate bone layers.

Level I

Lithic Assemblage. Forty Old Women's Prairie Side-Notched points were recovered, as well as bifaces, end/sidescrapers, unifaces, pièces esquillées, cores, and 64 bone tools; no ceramics were found. Use of local lithics, especially cherts, quartzites, and petrified wood, continues (Table 11).

Features and Activities. Hearths were flat (presumably surface hearths) and

Estuary Site Lithic Data (data from Adams 1977)

| Level I | Artifacts N | Flakes N | Total N | Total % |
|---|---|---|---|---|
| Cherts | 37 | 42 | 79 | 19.3 |
| Montana Chert* | 1 | - | 1 | 0.2 |
| Brown Chalcedony* | 4 | 12 | 16 | 3.9 |
| White Chalcedony | 2 | 1 | 3 | 0.7 |
| Petrified Wood | 17 | 46 | 63 | 15.4 |
| Jasper | 4 | 6 | 10 | 2.4 |
| Quartzite | 49 | 191 | 240 | 58.5 |
| Schist | - | 7 | 7 | 1.7 |
| Sandstone, limestone, dolomite, granites | - | 18 | 18 | 4.4 |
| Totals | 114 | 323 | 437 | 106.5 |

| Level II | Artifacts | Flakes | Total N | Total % |
|---|---|---|---|---|
| Cherts | 44 | 44 | 88 | 28.4 |
| Montana Cherts* | 3 | - | 3 | 1.0 |
| Avon Chert* | 1 | - | 1 | 0.3 |
| Brown Chalcedony* | 8 | 4 | 12 | 3.9 |
| White Chalcedony | 5 | 1 | 6 | 1.9 |
| Petrified Wood | 12 | 54 | 66 | 21.3 |
| Jasper | 4 | 8 | 12 | 3.9 |
| Quartzite | 47 | 51 | 98 | 31.6 |
| Schist | - | 11 | 11 | 3.5 |
| Sandstone, limestone, dolomite, granites | - | 13 | 13 | 4.2 |
| Totals | 124 | 186 | 310 | 100.0 |

* Non-local

Table 11. Estuary site Lithic Data

circular in shape and the presence of a few charcoal concentrations was noted. Activities which were occurring during the Level I occupation consisted of lithic preparation as suggested by concentrations of debitage; bison processing and secondary butchering as indicated by the presence of highly butchered bison bone; and use of fire in processing (Adams 1977:66). Adams (1977:66) further suggests that at this time, the site possibly functioned as a butchering-processing acitivty area for a nearby drive site.

Radiocarbon Dates. Level I, representing the Old Women's Phase occupation, was dated at A.D. 930±80 and A.D. 880±70 (or 1020±80 B.P. and 1070±70 B.P.; Adams 1977:142).

Faunal Assemblage. Concerning seasonality, Adams (1977:66) concludes that based on mandibles, tooth eruption and wear, the site's sheltered location, the presence of hearths, the lack of tipi rings, the number of artifacts and the size of the refuse areas, it appears that both occupations occurred during the late winter or late summer season.

Discussion. Adams (1977:144) feels that the mixing of Avonlea and Prairie Side-Notched points in one component strongly suggests Avonlea-Prairie Side-Notched affinities. Therefore, Adams (1977:142) concludes that the evidence from Estuary indicates that Avonlea was responsible for the development and proliferation of the Old Women's Phase.

Morkin Site (DlPk-2)

Introduction. The Morkin site (Bryne 1973) is a buried multicomponent campsite with rich cultural deposits, located in the transition zone between the parkland of the Porcupine Hills and open prairie (Figure 5). The site is situated on the lowest terrace of Trout Creek in the southwest corner of Alberta. Cultural material recovered from excavations include 3800 potsherds and 577 projectile points and fragments.

Stratigraphy. Byrne (1973:12) notes that there are problems with the stratigraphic sequence at the site, which leads to difficulty in interpreting and isolating individual stratigraphic levels. However, he argues for five major stratigraphic horizons at Morkin. Level 5, the lowest, is dominated by Besant and Plains triangular points suggesting a strong late Middle Prehistoric Besant association. Level 4 contains side-notched, Avonlea and Plains Triangular points suggesting an Avonlea association (Byrne 1973:252). Level 3 is dominated by small notched points with few Avonlea points while Level 2 contains primarily side-notched points along with several historic trade points. Level 1, the latest, is dominated by side-notched points and historic trade points. This trend, beginning with the early dominance of Besant followed by Avonlea, then side-notched and finally historic trade points,

parallels the trends of projectile point sequences at other sites on the Northwestern Plains (Byrne 1973:250).

Lithic Assemblage. Specifically at the Morkin site, Byrne (1973:241) identified several obvious trends. Open side-notching or "U"-shaped notching was predominant in lower levels, but declined as closed or rectangular notching increased dramatically in upper levels. Other projectile point trends include the following (Byrne 1973:248): (1) side-notched points have a low frequency in level 5 but increase to become the dominant type in upper levels; (2) Besant is the most common in level 5 but decreases in frequency until it is absent in level 1; (3) Avonlea points are few in number in lower levels but become common in levels 4 and 3, then drop in frequency in levels 2 and 1; and (4) Plains Triangular points are common in level 5, increase in levels 4 and 3, and then decline in frequency in levels 2 and 1.

Radiocarbon Dates. Several radiocarbon dates were obtained. Level 5 is radiocarbon dated to A.D. 610±130. Level 4 has three dates, A.D. 745±90, 760±130, and 1390±210, of which the last one is considered to be incorrect. Level 3 also has three dates: A.D. 1155±85, 1250±90, and 1280±95. Levels 2 and 1 each have one date, A.D. 1700± 95 and 1845±90 respectively (Byrne 1973:253). Based on these dates and obsidian hydration estimates, Byrne (1973:258) provides approximate ages for each cultural level. Level 5, with

Besant affiliations is dated from A.D. 500 to 700; Level 4 (Avonlea affiliations) from A.D. 700-900; Level 3 from A.D. 1100-1400; Level 2 from A.D. 1700-1800; and Level 1 associated with trade items at A.D. 1850.

Discussion. Byrne (1973:468-469) concludes that points at Morkin suggest earlier side-notched points have more in common with Avonlea rather than with Besant points thus side-notched points of the Old Women's Phase were probably an outgrowth of Avonlea points rather than Besant or Samantha points. Based on ceramics from the Morkin site, Byrne (1973:559) also concludes that continuities from Early Variant (Avonlea) to Late Variant (Old Women's) Saskatchewan Basin ceramics indicates a gradual development and that Old Women's Phase most likely developed from Avonlea or from a merging of Avonlea and Besant. Byrne (1973) focused his study primarily on pottery and points at the Morkin site and unfortunately a complete site report has yet to appear.

Whakpa Chu'gn Site (24HL101)

Introduction. The Wahkpa Chu'gn site, a multicomponent bison kill and campsite, is located along the Milk River (Figure 5), west of Havre in north central Montana (Davis and Stallcop 1966; Brumley 1971;1975;1976b). Cultural deposits are located on the floor of a steep-sided coulee adjacent to

the Milk River valley (Brumley 1971). Four areas were identified (Brumley 1971): Area A encompasses the east end of the site and contains cultural deposits of successive bison kills; Areas B and C both consist of camp and bison kill deposits, while Area D contains stratified campsite deposits. In area A, several "post-pits" were discovered during excavation. These were comprised of deep U-shaped pits containing two wooden posts wedged apart with a whole or partial bison crania. These post pits most likely represent portions of corral-like structures used to contain bison that had been herded over the bluffs (Brumley 1971:22). Brumley (1971:23) concludes it was probably a bison pound rather than a jump because of the lack of major bone deposits at the base of the bluffs.

Lithic Assemblage. Also recovered from excavations were 129 projectile points, 101 of which were Old Women's points (Plains-75; Prairie-26) and seven of which were Avonlea points (Brumley 1971:24). The basic trend exhibited by the points begins with Avonlea, and Head-Smashed-In Corner-Notched points in the lower levels, followed by Prairie Side-Notched and then Plains Side-Notched in the upper levels (Brumley 1971:24). Lithic types utilized in point manufacture include the following: agate 48.5%; chert 15.5%; silicified siltstone 13.8%; flint 9.7%; agatized wood 4.2%; obsidian 3.4%; quartzite 2.1%; argillite 2.1%; and slate 0.7% (Davis and Stallcop

1966:14). In addition to points, a few bifaces and bone tools were recovered. Overall, the majority of artifacts from Whakpa Chu'gn were made from chalcedonies, agate, flint, cherts, and jaspers while quartzite was primarily utilized for larger scrapers and chopping tools (Davis and Stallcop1966:10).

Features and Activities. The presence of ash, heavily butchered bone fragments, charcoal, hearths, fire-broken rock, and debitage suggests camp and processing activities.

Stratigraphy. Six cultural units were identified in Area A. Layers 2, 4, 6, and 8 consisted of Old Women's bison kill deposits, while upper layer 9, also associated with Old Women's complex, contained the post-pit features, and lower layer 9 contained Avonlea deposits (Brumley 1975:108).

The earliest use of the entire site was by Besant peoples as indicated by extensive layers of butchered bison bone and Besant points found in area B (Brumley 1975:107). The site was then abandoned and reoccupied by Avonlea peoples, but the sparse Avonlea assemblage suggests only light use of the site at this time (Brumley 1975:107). Following Avonlea, the area was extensively and repeatedly used by Old Women's Phase peoples, with the kill and campsite and processing areas and the wooden pound structure indicating bison were being trapped, killed and processed (Brumley 1975:107).

Radiocarbon Dates. Thirteen radiocarbon dates were taken at the site (Brumley 1975:114). Five of these dates relate to the Besant Phase: 50±70 B.C.; A.D. 190±110 and A.D. 30±70, and A.D. 225±120 all associated with Besant points; and A.D. 880±20 which is an unacceptable date range for Besant. The remaining eight dates are associated with Old Women's occupations but only three were considered to be acceptable: A.D. 1020±100, A.D. 960±100, and A.D. 1390±90.

Discussion. Davis and Stallcop (1966:26) believe that the sequence at Whakpa Chu'gn is closely similar to that at the Old Women's buffalo jump, even though Whakpa Chu'gn side-notched points include a few different varieties from those at the Old Women's jump. Only Nanton, Irvine, High River, and a few Paskapoo points appear in Whakpa Chu'gn deposits.

The most recent occupation at Wahkpa Chu'gn is a sparse Prairie/Plains occupation with a small number of potsherds similar to Saskatchewan Basin complex ceramics. Underlying this occupation is a series of camp and kill deposits characterized by Prairie/Plains points and no ceramics. This series is dated to A.D. 900- A.D. 1300 and is termed the Saddle Butte Complex (Brumley and Dau 1988:56). The style, quality of workmanship and lithic types of Saddle Butte points are similar to those found in Old Women's sites throughout southeastern Alberta. Saddle Butte peoples, as did Old Women's

groups, relied heavily on lithic materials from locally obtainable tills and river gravel (Brumley and Dau 1988:56).

H.M.S. Balzac Site (EhPm-34)

Introduction. The H.M.S. Balzac site, located approximately two kilometres north of Calgary along a tributary of the Bow River (Figure 5), is a Late Prehistoric, deeply stratified habitation site which contains multiple discrete occupations for both the Avonlea and Old Women's Phases (Head 1985:100). Natural depositional events such as periodic flood cycles, buried the site at 150-250 year intervals, thus providing an extraordinary opportunity to examine cultural continuity and change for the Late Prehistoric period (Head 1985:112). The site is thought to have served as a camp and processing area, most likely for a closely related kill site (Head 1985:112). Cultural materials recovered during excavations consisted of tools, debitage, faunal material, and ceramics.

Lithic Assemblage. With regards to tools, retouched flakes were the largest category followed by bifaces and fragments, projectile points, scrapers, and lastly wedges (pièces esquillées). The most common raw material used in tool manufacture was various types of cherts, followed by siltstones, quartzites, and silicified wood (Head 1985:106) (Table 8). Siltstones and

pebble cherts were most common in endscraper manufacture while sidescrapers were most often made of quartzite (Head 1985:106-107). Endscrapers appeared to be more often associated with Old Women's levels while sidescrapers were most common in Avonlea layers (Head 1986:17-18). Over half the sample of wedges recovered were associated with a single Old Women's occupation (Head 1985:107). The remaining tool types included cores and fragments, drills, gravers, and a hammerstone and chopper. Debitage indicates that tool resharpening was common but not primary tool manufacture (Head 1985:107).

The lithic assemblage exhibits a wide range of material types, most of which are available locally (quartzites, petrified wood, mudstones, siltstones, and cherts). Non-local items consisted of obsidian with probable sources being at Obsidian Cliff, Wyoming, or in the northwestern United States and central British Columbia, and quartz crystal with the closest source being in the Rocky Mountains to the west of the site (Head 1985:105). The most obvious difference in lithic use between Old Women's and Avonlea occupations is in the relative use of obsidian and quartz crystal (Head 1985:106). Obsidian was heavily used during the Old Women's Phase and virtually non-existent in Avonlea assemblages. Quartz crystal is restricted almost exclusively to the Avonlea component of the site. In addition, petrified

wood which is stongly represented in the Old Women's levels is only marginally present in Avonlea deposits. Quartzite use is also more common during Avonlea times (Head 1985:106).

Ceramics. Ceramics were found in both phases but in low quantities (no quantities provided). Old Women's ceramics usually have smoothed exterior and interior surfaces with faint suggestions of grooved exterior impressions, possibly from a cord-wrapped paddle. Avonlea ceramics have exterior decoration of deep irregular impressions, suggesting possibly cord impressions (Head 1985:109).

Faunal Assemblage. Bison remains constitute most of the faunal remains with a few deer, antelope, canid, badger, and beaver bones.

Features and Activities. Several features were uncovered during excavations (Head 1985:110). Hearths were generally basin-shaped, with fill consisting of charcoal, ash, burnt and unburnt bone, fire-broken rock, and other cultural materials. Excavated pit features consisting of ash, charcoal, fire-broken rock, and bone seem to represent discarded materials. In addition, a possible sandstone slab stone circle was located on the Avonlea floor. The bison bone recovered is extremely fragmented suggesting heavy butchering (Head 1985:107). Furthermore, fragmented bone and fire-broken rock suggest that the extraction of bone marrow and grease had occurred (Head 1986:203).

Also, the presence of bone fleshers indicates hide preparation was undertaken at the site (Head 1986:206). The recurrent presence of foetal bison bones on multiple floors implies winter to early spring occupations (Head 1985:112).

Radiocarbon Dates. The Old Women's occupation at Balzac is radiocarbon dated at 320±50 B.P. while Avonlea dates are 1280±50 B.P. and 1540±50 B.P. (Head 1985:105).

Discussion. Head (1985:113) argues that the multiple Old Women's and Avonlea floors at Head-Smashed-In are directly comparable to those found at Balzac. The comparison of points at Balzac reveals a similar trend and distribution as Forbis (1962) described for the Old Women's Buffalo Jump from High River points to Pekisko style points (Head 1985:114). With regards to ceramics, both Old Women's and Avonlea are quite similar in construction with the exception of surface-finishing techniques (Head 1985:114). The most noticeable difference is that Avonlea ceramics contain no indication of the parallel grooved ware present at several sites in Montana, southern Saskatchewan, and at the Avonlea type site (Head 1985:114). More recently, Head (1988:63) notes that during the Late Prehistoric period, the Balzac site area served as an important and regular location for bison hunting and processing.

Although Head (1985:114) states that Balzac "affords an opportunity to examine cultural change over the last two millenia" he does not provide any statements or conclusions about the culture change that was occurring between the Avonlea and Old Women's Phases. He does state however, that similarities in the patterning among Avonlea and Old Women's components suggest some degree of continuity (Head 1986).

Garratt Site (EcNj-7)

Introduction. The Garratt site, a late Middle Prehistoric and Late Prehistoric campsite, is located in Kingsway Park in the southern section of the city of Moosejaw (Figure 5) in south-central Saskatchewan (Morgan 1979). It lies on an alluvial floodplain situated on the west side of Moose Jaw Creek near the confluence of a tributary valley entering the main valley. Sediment deposition involved fluvial and lacustrine processes. The stratigraphy at the site is divided into nine levels (Morgan 1979:88-90). The culture-bearing soil levels were levels 1-2 associated with Plains and Prairie Side-Notched traditions, level 6 associated with the Avonlea tradition, and level 8 being the earliest at the site and being associated with the Besant tradition. Each culture-bearing soil was clearly defined and separated by sterile soil levels.

Level 1 and 2.

Lithic Assemblage. Cultural material recovered from the level 1 and 2 excavations (Morgan 1979:261-317) included the following: several cores with cortex still present on the surfaces, thus suggesting that they were brought directly to the site with cortex still intact; a large number (N=2557) of flakes and fragments including pièces esquillées; projectile points consisting of two Plains Side-Notched and 19 Prairie Side-Notched and eight Plains Triangular point types; 67 lateral bifaces; 44 tubular bifaces or drills; 66 sidescrapers; 12 endscrapers; and very few heavy stone tools (one chopper, three hammerstones, and one utilized spall). Lithic types (Table 12) in this Prairie/Plains occupation level for artifacts consist of primarily chalcedony and chert making up just over 70% of raw materials in artifact manufacturing (Morgan 1979:280). In the unmodified flake category, sard or layered chalcedony and chert also are the major sources of raw material (62.5% of the total; Morgan 1979:280). With regards to the heavy stone industry, coarse-grained quartzite cobbles or pebbles are the major source of raw materials.

Ceramics and Miscellaneous Tools. Other cultural materials recovered from levels 1-2 include four bone tools, several historic artifacts (nails, a ring, a bead, several seed beads), and 254 ceramic sherds of three types. The latter

Garratt Site Lithic Data (data from Morgan 1979)

| Level 1-2 | Artifacts % | Debitage % |
|---|---|---|
| Quartzite | 8.1 | 7.8 |
| Layered Chalcedony | 40.3 | 36.7 |
| Knife River Flint | 14.5 | 16.8 |
| Chert | 30.3 | 25.8 |
| Quartz | - | 1.1 |
| Basalt | - | 2.0 |
| Rhyolite | 3.6 | 7.5 |
| Petrified Wood | 2.3 | 1.6 |
| Shale | 0.9 | 0.7 |
| Totals | 100.0 | 100.0 |

| Level 6 | Artifacts % | Debitage % |
|---|---|---|
| Quartzite | 9.1 | 15.5 |
| Layered Chalcedony | 13.0 | 17.5 |
| Knife River Flint | 32.2 | 13.1 |
| Chert | 42.2 | 44.3 |
| Quartz | - | - |
| Basalt | - | 0.4 |
| Rhyolite | 1.3 | 3.8 |
| Petrified Wood | 0.9 | 3.1 |
| Shale | 1.3 | 2.3 |
| Totals | 100.0 | 100.0 |

| Level 8 (Besant) | Artifacts | | Debitage | |
|---|---|---|---|---|
| | N | % | N | % |
| Quartzite | - | - | 137 | 74.0 |
| Chalcedony | - | - | 4 | 2.2 |
| Knife River Flint | 8 | 72.8 | 34 | 18.4 |
| Chert | 2 | 18.1 | 4 | 2.2 |
| Rhyolite | - | - | 3 | 1.6 |
| Petrified Wood | - | - | 3 | 1.6 |
| Misc. | 1 | 9.1 | - | - |
| Totals | 11 | 100.0 | 185 | 100.0 |

Table 12. Garratt site Lithic Data

Garratt Site Lithic Data Cont'd (data from Morgan 1979)

| Level 1-2 Points | Plains Side-Notched N | Prairie Side-Notched N | Triangular N |
|---|---|---|---|
| Quartzite | - | 2 | - |
| Chalcedony | - | 9 | 5 |
| Knife River Flint | - | 1 | - |
| Chert | 2 | 5 | 3 |
| Rhyolite | - | 1 | - |
| Petrified Wood | - | 1 | - |
| Totals | 2 | 19 | 8 |

| Level 6 Points | Avonlea N | Triangular N |
|---|---|---|
| Quartzite | 2 | 4 |
| Chalcedony | 4 | 1 |
| Knife River Flint | 8 | 5 |
| Chert | 5 | 16 |
| Rhyolite | - | 3 |
| Totals | 19 | 29 |

Table 12 (cont'd). Garratt site Lithic Data

includes Fabric-Impressed with a weaving pattern formed by the interlacing of cords, Plain with no impressed pattern visible on the sherd, and Cord-Impressed with a surface impressed with cord markings (Morgan 1979:294).

Level 6.

Lithic Assemblage. Level 6 artifacts (Morgan 1979:318-365) include several cores, numerous flakes and fragments (2697), 19 Avonlea projectile points, one Besant point and 29 Avonlea Triangular points, 36 lateral bifaces, 63 lateral unifaces, 32 endscrapers, 29 pièces esquillées, and very little heavy stone industry (a chopper, hammerstone, pestle and two utilized spalls). Lithic types for this Avonlea layer in the artifact category include chert (42.2%) and KRF (32.2%) as the most commonly used raw materials (Morgan 1979:336). In the unmodified flake category, chert (44.3%) and chalcedony (17.5%) are the primary raw materials. The high percentage of KRF artifacts suggests extensive and reliable exchange systems and the low flake to artifact ratio and the small size of the flakes imply that this raw material was brought to the area as partly finished artifacts (Morgan 1979:336). Knife River Flint (42.1%) is the major raw material utilized in the manufacture of the Avonlea point type while chert (53.3%) is the dominant source used in the Avonlea Triangular point type (Morgan 1979:336) (Table 12).

Ceramics and Miscellaneous Tools. Other cultural material recovered from this Avonlea layer include six bone tools, three shell artifacts, and 1526 ceramic sherds (85 rim and 1440 body). Of the body sherds, five types were identified (Morgan 1979:347-349): Knotted Open Net or net-impressed (70.3%) exhibits a surface with an arrangement of parallel threads crossed at regular intervals by others that are fastened to them so as to leave open spaces; Plain (272.%) exhibits no impressed pattern on the surface; Incised (1.4%) have incisions on the surface; Punctate (0.7%) have paired rows of circular punctates impressed on the surface; and Grooved Paddle (0.4%) exhibits impressions made with a flat paddle incised with shallow parallel grooves.

Level 8.

Lithic Assemblage. Level 8 artifacts consist of three Besant points, several flakes and fragments, and a low number of bifaces and unifaces and heavy stone industry tools. Although the sample size is small, one general trend emerges and that is the predominant use of KRF (Table 12), suggesting to Morgan (1979:369) a heavy reliance on outside sources for raw materials most likely acquired through extensive trading. However, the sample collection is so small that statements such as this remain doubtful.

Discussion. Cross-level comparisons between Avonlea and Prairie/Plains

occupations reveal several trends. In Avonlea, unnotched point forms represent 65% of the sample while in the Old Women's side-notched tradition only 27.6% of the sampie is unnotched. Reeves (1983a) suggests a low frequency of unnotched points is characteristic for Avonlea, but Morgan (1979:387) argues that his data are almost exclusively from kill sites and that a high frequency of unnotched forms is characteristic of campsites for a range of cultural groupings. This has also been pointed out by Dawe (1987:152). Unnotched triangular points have been recovered from Late Prehistoric campsite and processing sites but rarely from kill site deposits. Therefore it is possible that these unnotched triangular points are in actuality, preforms prior to notching. Furthermore, if projectile point preforms were obtained through long-distance trade, this has major implications for interpretations of ethnicity and projectile point typology (Dawe 1987).

Morgan (1979:387) also notes that asymmetry is a prominent feature in Prairie Side-Notched specimens and pointed unifaces are restricted to the Avonlea component. The side-notched tradition also has a higher frequency of rectangular pièces esquillées (Morgan 1979:388). With regards to lithics, Avonlea peoples had ready access to KRF quarries in North Dakota while the side-notched tradition raw materials show a heavy reliance on local materials and a reduced availability of KRF (Morgan 1979:388).

According to Morgan (1979:389-391) the Avonlea ceramics from the Garratt site show little correspondence to the ceramics found with the Plains/Prairie traditions and that there is therefore no evidence to suggest that Avonlea and side-notched ceramics represent a single cultural development as postulated by Byrne (1973). Morgan (1979:389-390) argues that the problem which emerges with Byrne's (1973) study is that he chose to analyze the Morkin site as if the cultural components were unmixed even though he admits (Byrne 1973:12-26) that there are major stratigraphic problems. This problem was also noted by Syms (1977:93) who pointed out that this mixing of assemblages due to stratigraphic problems has created a blending that has produced a series of gradual changes in artifact frequencies rather than possible discrete occupations with sharp breaks in artifact categories.

Seasonality. With regards to seasonality, Morgan (1979:174) suggests that Garratt represents a fall, winter, and early spring human occupation area based on four factors: (1) the site is located on the southern periphery of the bison winter range; (2) the site is located in a valley complex system an area favoured by the herds in fall and most of the winter; (3) the valley complex was the preferred wintering area in the historic time period; and (4) the analysis of foetal bison materials indicates that the specimens were taken while in utero around March.

Radiocarbon Dates. Several radiocarbon dates were obtained from the Garratt site (Morgan 1979:246). Level 6 was dated at A.D. 500±70 and at A.D. 670±60 while level 8, the Besant level was radiocarbon dated at 40±75 B.C. (1990±75 B.P.).

Gull Lake Site (EaOd-1)

Introduction. The Gull Lake site is a prehistoric bison drive located in southwestern Saskatchewan (Figure 5) on the north edge of a major escarpment, the Cypress Hills upland , at an elevation of 915 metres (Kehoe 1973). Prior to 1960, the site had only been tested and surveyed. It was not until the early 1960s that major excavations were conducted by T. Kehoe (in 1960 and 1963).

Stratigraphy and Radiocarbon Dates. During excavations, 52 natural and cultural layers were dug in the kill area to a depth of 20 feet below the surface. Kehoe (1973:192) groups these layers into five zones, four of which are occupation zones. Zone One is the deepest and includes layers 52 to 41 and consists of the natural foundation for the site, a slump block, with no cultural material present. Zone Two (layers 40-33), contains small amounts of bone and a bell shaped limestone pestle in layer 34 with a radiocarbon date of A.D. 50 ±65. Zone Three (layers 32-25) represents Avonlea occupations

and the first Gull Lake bison drive. Occupation layers are separated by layers of sterile slopewash and contain 6 black charcoal lenses and 6 bone layers. A radiocarbon date of A.D. 660 ± 60 from layer 26 suggest a termination date of Avonlea at Gull Lake. Zone Four (layers 24-15) consists of the Prairie occupation layers with three charcoal lenses overlaid by 3 bone layers. Layer 24 is radiocarbon dated at A.D. 730 ±80, dating the initial appearance of the Prairie complex at Gull Lake. The final zone, Zone Five (layers 14-1), represents the Plains occupation and cross-dating of artifacts places this zone at least at A.D. 1300.

Avonlea Lithic Assemblage: Projectile Points. Avonlea type points were found in layers 31c to 24 in Kehoe's 1963 excavations. The preferred materials (Table 13) for these points were petrified wood (32.2%) and chert (20.3%) while other lithics used included KRF (10.6%), chalcedonies (10.6%), non-chalcedony flints (7.8%), coarse white chert (6.5%), quartzite (5.0%), argillite (2.7%), fused clay (2.3%), agate (1.8%), and basalt (0.9%) (Kehoe 1973:53). Three types of Avonlea points were identified by Kehoe (1973:53), the majority being of the Gull Lake variety, coming from levels 31c to 26. Since layer 31a had a radiocarbon date of A.D. 210±60, Kehoe (1973:53) concludes that all Gull Lake points are of the approximate age of A.D. 200. A few Carmichael Wide-eared variety points were recovered from layers 29a to

Gull Lake Site Lithic Data (data from Kehoe 1973)

| POINTS | Avonlea (n=333) % | Prairie (n=241) % | Plains (n=102) % |
|---|---|---|---|
| Petrified Wood | 32.2 | 32.1 | 14.0 |
| Chert | 20.3 | 10.0 | 14.0 |
| Chalcedony | 10.6 | 9.1 | 16.0 |
| Knife River Flint | 10.6 | 21.1 | 8.0 |
| Non-Chalcedony Flint | 7.8 | - | 14.0 |
| Coarse White Chert | 6.5 | 10.0 | 22.0 |
| Quartzite | 5.0 | 4.6 | 4.0 |
| Argillite | 2.7 | 1.8 | - |
| Fused Clay | 2.3 | 2.7 | 4.0 |
| Agate | 1.8 | 1.8 | 2.0 |
| Basalt | 0.9 | - | - |
| Jasper | - | - | 4.0 |

| TOOLS | N | Comments |
|---|---|---|
| Endscrapers | 67 | - manufactured from cobbles |
| Sidescrapers | 126 | - made from brown chalcedony, pet. wood, quartzite, chalcedony, and chert cobbles |
| Knives | 262 | - made from cobbles; 70 of pet. wood |
| Drills & Perforators | 7 | - 1 brown chalcedony |
| Hammerstones | 9 | - 9 quartzite pebbles |
| Stone balls | 2 | - 1 sandstone and 1 quartzite |
| Groundstone Disk | 1 | - schist |
| Pestles | 2 | - 1 limestone and 1 sandstone |
| Totals | 476 | |

UNMODIFIED FLAKES n=238

| | Surface N | Avonlea N | Prairie N | Plains N | Total N |
|---|---|---|---|---|---|
| Basalt | - | - | 4 | - | 4 |
| Jasper | - | 1 | 5 | 2 | 8 |
| Petrified Wood | 12 | - | 53 | 15 | 80 |
| Chalcedony | 10 | 6 | 61 | 38 | 115 |
| Quartz | 1 | - | 6 | 2 | 9 |
| Argillite | - | - | - | 3 | 3 |
| Chert | - | 1 | - | 4 | 5 |
| Flint | 1 | - | 1 | 6 | 8 |
| Quartzite | 2 | - | 3 | 1 | 6 |
| Totals | 26 | 8 | 133 | 71 | 238 |

Table 13. Gull Lake site Lithic Data

24 and a few Timber Ridge sharp-eared variety points from layers 27-26, with approximate ages based on radiocarbon dates of > A.D. 800 and A.D. 600-700, respectively (Kehoe 1973:53-55).

Prairie Lithic Assemblage: Projectile Points: The majority of the Prairie Side-Notched points were recovered from layers 24 to 15, with only one below layer 24 and only four above layer 15 (Kehoe 1973:56). Because layer 24 has a radiocarbon date of A.D. 730±80, Kehoe (1973:56) concludes that around A.D. 730, the Prairie Side-Notched point either first appeared or became important around this time at Gull Lake. Types identified by Kehoe (1973:57) include Swift Current Fish-Tail, Irvine Narrow Square Base, Shaunovon Truncated-Base, High River Small Corner-Notched, Lewis Narrow Rounded Base, Tompkins Side/Corner- Notched, and Nanton Wide Rounded Base. Preferred materials (Table 13) for Prairie points included petrified wood (32.1%), and KRF (21.1%) with other chalcedonies (9.1%), coarse white chert (10%), other cherts (10%), quartzite (4.6%), argillite (1.8%), fused clay (2.7%), and agate (1.8%) (Kehoe 1973:57).

Plains Lithic Assemblage: Projectile Points: Most of the Plains Side-Notched points recovered from Kehoe's excavations came from layers 8 to 6 and were identified as Paskapoo Square-Ground Base, Pekisko Concave-Base V-Notched, and Washita triangular (Kehoe 1973:60-61). The preferred

materials (Table 13) for these points include cherts (coarse white chert 22% and other cherts 14%), with KRF (8%), other chalcedonies (16%), flint (14%), petrified wood (14%), jasper (4%), fused clay (4%), quartzite (4%), and agate (2%). Forbis (1962:104) estimated the appearance of the Plains type around A.D. 1000 but Kehoe (1973:60) considers this too early and suggests initial appearance of the Plains type in the northern Plains at about A.D. 1300-1500.

Lithic Assemblage. Of the 1885 finished stone artifacts recovered from Gull Lake excavations, over half (979) were projectile points (Kehoe 1973:47). Besides projectile points, other flaked stone artifacts are not abundant at Gull Lake. The quartzite cobble industry at Gull Lake comprised 190 tools, classified into three types (Kehoe 1973:80). Teshoa quartzite tools, which are cortex flakes struck from a cobble that were used for butchering and working hides, were found in all occupation layers. Quartzite choppers, core tools made on cobbles by striking off large flakes to produce a steeply bevelled cutting edge, were also recovered from all levels at Gull Lake (Kehoe 1973:83). The final category consisted of quartzite flake knives used in cutting bison carcasses and the cores from which flakes were removed (Kehoe 1973:84-86).

Other stone tools included endscrapers, sidescrapers, stone knives, unmodified flakes, drills/gravers, hammerstones and pestles. Sixty-seven

small endscrapers, oval to sub-triangular in shape, were recovered. Certain features and attributes of these endscrapers were selected for measurement to test their possible use as temporal indicators but no distinctive temporal or cultural differences could be derived between layers (Kehoe 1973:96). Stone knives, most likely used to butcher meat and cut the hide from the carcass, were found in all occupation levels; however, oval knives are restricted to Avonlea and then later become narrower to form long slender knives in upper layers (Kehoe 1973:193). The largest group of knives at Gull Lake is that of the irregular petrified wood knives, whose flaking shows little alteration and whose form is irregular because the cleavage lines of the petrified wood make symmetrical shaping difficult. These were found in all layers (Kehoe 1973:108). Stone knives are more numerous in the Prairie assemblage than in Avonlea or Plains layers and especially numerous in layer 24 which exhibits a greater variety of knives, more stylized forms, and more irregular petrified wood knives (Kehoe 1973:193). The majority of the unmodified flakes at Gull Lake were found in Prairie and Plains occupations (Kehoe 1973:110). The occurrence of pecked, abraded and polished stone tools is very low at the site with nine quartzite cobble hammerstones, and two bell-shaped pestles, two stone balls, two handstones, and one ground stone disk being recovered (Kehoe 1973:113).

Overall, the preferred lithic materials at Gull Lake were cherts, chalcedonies and petrified wood with the additional use of quartzite, argillite and fused clay (Table 13).

Ceramics and Bone Tools. Two hundred and six pottery sherds were found during Gull Lake excavations. Kehoe (1973:122-125) assigns them to the Pisamiks Tradition as described by A. Kehoe (1959). According to Byrne (1973:526), Ethridge ware of the Pisamiks Tradition appears to correspond fairly well with his definition of the Late Variant of the Saskatchewan Basin tradition. Kehoe divides these Gull Lake ceramics into four types. Gull Lake Cord-Impressed pottery, the earliest, appears in layer 24, a lower Prairie level and continues till layer 15, an upper Prairie level, where it changes to plain pottery or Gull Lake Pottery. Then in Plains layers 6-8, Gull Lake Fabric Impressed and Gull Lake Incised Pottery appears, and continue till the final occupations of the site. Kehoe (1973:125) notes the absence of pottery in Avonlea layers at Gull Lake.

Bone artifacts (awls, spatulas, skinning knives, scrapers, flakers) appear in all layers, but are most numerous and contain a greater variety in the Prairie occupation layer 24, a parallel situation to the stone knives (Kehoe 1973:140).

Faunal Assemblage. It is impossible to estimate the season of each drive

because of the vastness of accumulated bone and the small samples taken (Kehoe 1973:145). Also, according to the excavator, the samples could be biased by the removal of certain kinds of carcasses from the site because it is possible that smaller and younger animals were removed and therefore underrepresented at the site (Kehoe 1973:194).

Discussion. In summary, in the cultural sequence at Gull Lake, Kehoe (1973) places the earliest bison drives which are associated with Avonlea points, particularly the Timber Ridge Sharp Eared variety, around A.D. 210 (layers 31c-24). By A.D. 660, with the first appearance of Prairie Side-Notched points, the Prairie occupation begins (levels 24-15). A few Avonlea points are found in association with Prairie points in level 24 at the site (Kehoe 1973:40). By A.D. 1300, the site was occupied by a group associated with the Plains tradition (levels 14-1), characterized primarily by Plains Side-Notched points and a few Prairie points in lower levels. Because of the presence of earlier points in the lower levels of subsequent phase levels, it appears that the cultural levels at Gull Lake suggest a possible transition between the Avonlea and Old Women's Phases. However, because each of the three point types predominates in its own zone, Kehoe (1973:192) suggests that each is connected with a different cultural group: Avonlea is associated with Athabascan populations; Prairie is associated with Algonkian peoples

deriving from the Besant; and Plains is associated with the Mississippian sphere of influence.

# CHAPTER THREE

# ANALYSIS OF CHANGES FROM AVONLEA TO OLD WOMEN'S PHASES

A detailed analysis of the continuity or discontinuity, that is, the similarities and differences, found in lithic and ceramic assemblages between the Avonlea and Old Women's phases will be presented here.

## LITHIC UTILIZATION

Comparisons of lithic utilization between sites has been hampered by the differences in the content and presentation of site reports, and variation in terminology, material groupings and definitions. In addition, the term "local" lithic is defined as that which is commonly found in the site area, derived from local bedrock and glacial deposits and river gravels. An "exotic" lithic, on the other hand, is that which is located outside the general site exploitation area, at some distance away from the site and requiring trade connections with other groups or long-distance seasonal movements to obtain it.

The Besant Phase, which preceded and then co-existed in time with the Avonlea Phase apparently relied heavily upon the use of exotic lithics, especially KRF (Reeves 1983a:191-192; Milne 1988; Morgan 1979). From

this, Reeves (1983a) speculates that Besant social organization and communication was superior to Avonlea and was possibly connected with the Hopewellian Interaction Sphere. Morgan (1979:391) has also suggested that both Besant and Avonlea had stronger trade networks to the south than the later side-notched traditions of the Old Women's Phase. However, in spite of the observations made by these investigators, it must be noted that not all Besant sites reveal a strong reliance on exotic lithics; instead they range from the extensive use of exotic material such as KRF to little or no use of it at all. For example, at both the Melhagen site (Phenix 1969:14) in Saskatchewan and the Muhlbach site (Gruhn 1969:142-144) in Alberta, KRF is used for the manufacture of 70-90% of all artifacts, whereas at the Grandora site (Dyck 1972:9-11), tools and debitage consisted primarily of limestones and cherts with only four KRF flakes being recovered from excavations. Although the presence of KRF immediately suggests some sort of trading connections with the south, a KRF-like lithic material has been recovered from the Hand Hills area in Alberta. This raw material, Hand Hills Agate, has appeared in plowed fields in the area, but the primary source region is still unknown (Bruce Ball, pers. comm. 1989). If a source does exist in this area and Hands Hill Agate has been mistakenly identified as KRF, we may be forced to re-evaluate and modify our interpretations of trade, especially concerning the Alberta region.

The majority of Avonlea Phase sites indicate that the inhabitants relied primarily upon locally obtained raw materials, particularly petrified wood, cherts, quartzites, and fine chalcedonies. At the Avonlea type site in Saskatchewan, slightly over 45% of all lithic artifacts were manufactured from local cherts (Table 1). At the Larson site, lithics represented in debitage and tools were dominated by locally available cherts (47.6%), and quartzite (45.0%) (Table 2). Both the Lebret and Manyfingers sites have assemblages consisting primarily of local quartzites and cherts (Table 3). Seventy-one percent of all debitage recovered from the Lost Terrace site consisted of local cherts, quartzite, chalcedony, and jasper (Table 5). Avonlea projectile points from the Fantasy site were manufactured primarily from local cherts, chalcedony, basalt, and porcellanite (Table 4). Level II at the Estuary site, interpreted as an Old Women's/Avonlea occupation zone, shows an emphasis on local quartzite, petrified wood, and cherts for artifact manufacturing (Table 11). At the Balzac site, local cherts and siltstones dominated that tool assemblage along with a high percentage of quartzite (Table 8). Avonlea layers at the Garratt site, also revealed an emphasis on cherts and quartzites in tool manufacturing (Table 12). Lastly, a high number of Gull Lake Avonlea points were made from local petrified wood, chert, and chalcedony (Table 13).

Despite this emphasis on local lithics, the presence of KRF in several Avonlea assemblages indicates that Avonlea Phase peoples were not unfamiliar with this material. Of all tools and debitage at the Avonlea type site, 15.2% were manufactured from KRF (Table 1). Knife River Flint was also found in very small quantities at the Larson site (Table 2), the Lebret site (Table 3), the Fantasy site (Table 4), the Estuary site (Table 11), and the Empress site (Table 8). At the Garratt site in Saskatchewan, a rather high percentage of artifacts (32.2%) and debitage (13.1%) consisted of KRF (Table 12). Similarly, at Gull Lake, slightly over 10% of Avonlea points were manufactured from KRF (Table 13). This evidence contradicts Reeves' (1983a) implication of "inferior" communication or trade networks of Avonlea peoples. Although Avonlea peoples did rely mainly on local lithic resources, they were not averse to obtaining some fine-grained materials through trade or seasonal round movements (Wilson-Meyer and Carlson 1985:30).

The Old Women's Phase sees a continuance of local lithics, and, according to Reeves (1983a), an increasing emphasis on the use of petrified wood. For example, at the Lazy Dog site, local quartzite, chert, and pebble cherts dominated the lithic assemblage (Table 6). Similarly, at both the Ellis and Saamis sites, tools and debitage consisted primarily of local cherts, quartzites, and petrified wood (Table 7). At the Garratt site in Saskatchewan,

local chalcedony and cherts dominate the Old Women's lithic assemblage (Table 12), while at the Gull Lake site , the Old Women's assemblage consists primarily of local petrified wood, cherts and chalcedony (Table 13). At the Ramillies sites, where both Avonlea and Old Women's assemblages are mixed, the dominant lithic materials are local cherts and petrified wood and quartzite (Table 10). Local materials, especially cherts and quartzites, also dominate the mixed Avonlea/Old Women's assemblage at the Empress site (Table 8).

At Head-Smashed-In, Old Women's levels produced a large number of tools of petrified wood (Table 9) and was the primary basis for Reeves' (1983a) conclusion for an Old Women's emphasis on petrifed wood. This does not, however, seem to apply to all Old Women' sites. While present at most of these sites, petrified wood is not always more frequent than in Avonlea layers (for example, the Garratt site, Table 12; Estuary site, Table 11; and Gull Lake site, Table 13). Here is an example common to some Plains archaeologists, of making generalizations, based on data from a single site, and then applying it to all other sites of the same time period without testing the accuracy of the statement with comparative site data.

The lithics which predominant in Avonlea assemblages seem to be cherts, chalcedonies, quartzites, with small amounts of petrified wood,

obsidian, KRF, and exotic cherts (Table 14). Lithics from Old Women's sites and mixed Avonlea/Old Women's assemblages are similar: cherts, quartzites, with a definite increase in petrified wood utilization and the presence of small amounts of exotic obsidian, KRF, and exotic cherts (Table 15 and 16).

A major problem encountered during this study concerns the comparability of site report data. Variations in terminology and definitions of raw material types and lithic tool types exist and often prevent comparisons. In addition, raw material data is often provided only for projectile points, while other stone tools and debitage are ignored. This reinforces the importance placed on projectile points in Plains Archaeology. Furthermore, determining exotic versus local lithic material percentages is often impossible because there is frequently no distinction made between local and exotics. Lithic materials are generally classified into broad categories of cherts or chalcedonies and exotic versus local lithic frequencies are rarely provided. A particular lithic material can be local to one area but not to another and this must be noted when comparing lithic material sources between sites over large regions. Swan River chert, for example, is found locally in glacial and river gravels in southeastern Alberta and southwestern Saskatchewan, but is not locally available in the Head-Smashed-In site region in southwestern Alberta. Even though there is a great amount of data dealing with the Late

| SITE | CHERT | Swan River | Pebble | Montana | Avon | CHALCEDONY | KRF | QUARTZITE | QUARTZ | JASPER | PET. WOOD | ARGILLITE | BASALT | SANDSTONE | SILTSTONE | SIL.SEDIMENTS | OBSIDIAN | SHALE | RHYOLITE | PORCELLANITE | x present<br>√ small amounts<br>SOURCE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Avonlea | x | x | √ | | | x | x | √ | √ | √ | √ | | √ | √ | - | | - | √ | √ | √ | Klimko & Hanna 1988 |
| Larson | x | | | | | √ | √ | x | √ | √ | √ | x | | | | | | | | | Milne 1988 |
| Manyfingers | x | x | | x | x | x | | x | | | · | x | | | | | √ | | | | Quigg 1988b |
| Yellowsky | x | √ | ' | | | √ | | x | x | | √ | | | | | x | | x | | | Wilson-Meyer & Carlson 1985 |
| Lebret | x | x | x | | | | x | | x | | | | x | | | x | | x | | x | Smith & Walker 1988 |
| Fantasy | x | | | | | √ | √ | √ | | | √ | √ | x | | | | | | | x | Tratebas & Johnson 1988 |
| Lost Terrace | x | | | | | x | | x | | x | x | | √ | | | √ | x | | | √ | Greiser 1988 |
| Head-Smashed-In | x | | | x | | | | | | | | | | | | | | | | | Reeves 1978 |
| Balzac | x | | | | | | | x | x | | √ | | | | x | | √ | | | | Head 1985 |
| Garratt | x | | | | | x | x | x | | | √ | | √ | | | | | √ | √ | | Morgan 1979 |
| Gull Lake | x | | | | | x | x | x | | | x | √ | √ | √ | | | | | | | Kehoe 1973 |

Table 14. Avonlea Sites Lithic Materials

| SITE | CHERT | Swan River | Pebble | Montana | Avon | CHALCEDONY | KRF | QUARTZITE | QUARTZ | JASPER | PET. WOOD | ARGILLITE | BASALT | SANDSTONE | SILTSTONE | SIL. SEDIMENTS | OBSIDIAN | SHALE | RHYOLITE | PORCELLANITE | x present<br>√ small amounts<br>SOURCE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lazy Dog | x | | x | | | √ | | x | | | √ | | | √ | | | √ | | | | Quigg 1978 |
| Ellis | x | x | | | | | | x | | | | | | | | | | | | | Brumley 1985 |
| Saamis | x | | | | | √ | | x | | | x | √ | | √ | √ | | √ | | | | Milne 1978 |
| Head-Smashed-In | x | | | | | | | | | | x | | | | | | | | | | Reeves 1978 |
| Balzac | x | | | | | | | x | √ | | x | | | | x | | x | | | | Head 1985 |
| Estuary I | x | | | √ | | √ | √ | x | | √ | x | | | √ | | | | | | | Adams 1977 |
| Garratt (1-2) | x | | | | | x | x | x | √ | | √ | | √ | | | | | √ | √ | | Morgan 1979 |
| Gull Lake | x | | | | | x | x | x | √ | √ | x | √ | x | | | | | | | | Kehoe 1973 |

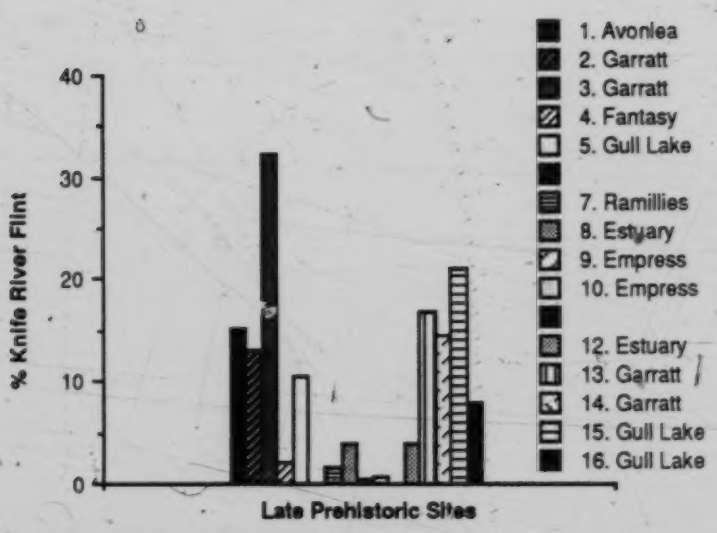
Table 15. Old Women's sites Lithic Materials

| SITE | CHERT | Swan River | Pebble | Montana | Avon | CHALCEDONY | KRF | QUARTZITE | QUARTZ | JASPER | PET. WOOD | ARGILLITE | BASALT | SANDSTONE | SILTSTONE | SIL SEDIMENTS | OBSIDIAN | SHALE | RHYOLITE | PORCELLANITE | x present<br>√ small amounts<br>SOURCE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Empress | x | x | x | | √ | √ | √ | x | √ | | x | √ | | √ | | x | √ | | | | Hudecek 1988 |
| Ramillies | x | | | | | | √ | x | | | x | √ | | | | √ | √ | | | | Brumley 1976a |
| Estuary II | x | | | √ | √ | √ | √ | x | | √ | x | | | √ | | | | | | | Adams 1977 |

Table 16. Mixed Avonlea/Old Women's sites Lithic Materials

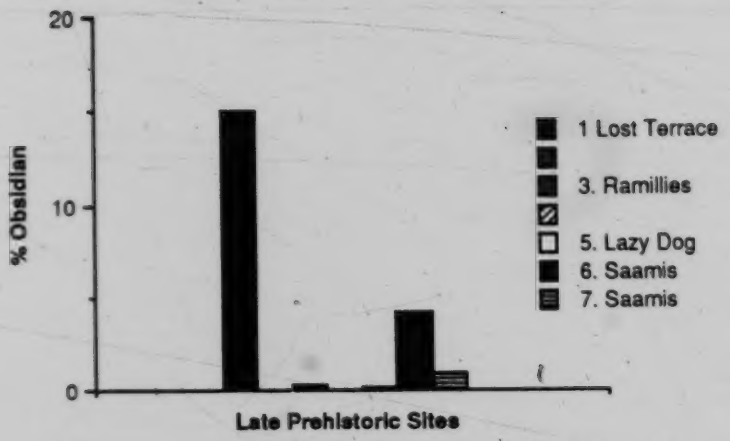
Prehistoric period in the Northwestern Plains, it is not in a form that facilitates comparative analysis.

Because of the above, it has not been possible to detail differences in lithic sources (exotic versus local) from the Avonlea Phase to the Old Women's Phase. However, one can get a general impression by utilizing three lithic types that are common in site analysis, KRF, obsidian, and petrified wood. On this basis, the percentage of exotic KRF in both Avonlea and Old Women's Phase sites (Figure 7) is about the same (approximately 15%); while in mixed Avonlea/Old Women's Phase assemblages, the exotic KRF is relatively uncommon. Obsidian appears to be relatively rare in Avonlea sites (except for the Lost Terrace site) with possibly slight increases during the Old Women's Phase (Figure 8), an observation made by Davis (1972:143) for the southern Canadian Plains. Lastly, petrified wood, chosen as an indicator of local lithic use, is found in relatively small amounts in Avonlea sites (except for Gull Lake) and generally is more frequent during the Old Women's Phase (Figure 9). Unfortunately, because of the limited number of published site reports which provide these data, the frequencies of these lithic material types tell us very little, and in fact, could be providing an inaccurate picture of the ratio of exotic to local materials.



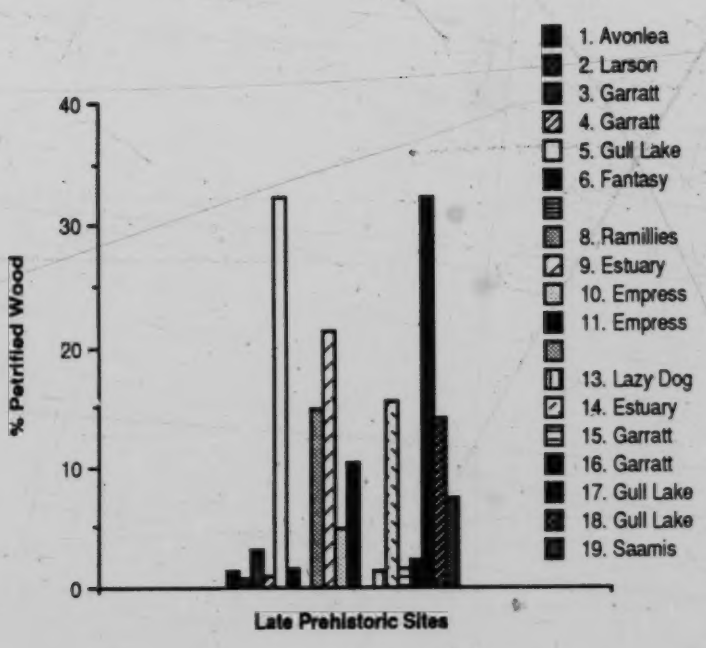

| SITE | PERCENTAGE OF |
|---|---|
| 1. Avonlea (Av) | Total Lithics |
| 2. Garratt (Av) | Debitage |
| 3. Garratt (Av) | Tools |
| 4. Fantasy (Av) | Points |
| 5. Gull Lake (Av) | Points |
| 7. Ramillies (Av/OW) | Total Lithics |
| 8. Estuary (Av/OW) | Total Lithics |
| 9. Empress (Av/OW) | Debitage |
| 10. Empress (Av/OW) | Tools |
| 12. Estuary (OW) | Total Lithics |
| 13. Garratt (OW) | Debitage |
| 14. Garratt (OW) | Tools |
| 15. Gull Lake (OW) | Prairie Points |
| 16. Gull Lake (OW) | Plains Points |

Figure 7. Percentages of Knife River Flint in selected Late Prehistoric Sites




| SITE | PERCENTAGE OF |
|---|---|
| 1. Lost Terrace (Av) | Debitage |
| 3. Ramillies (Av/OW) | Total Lithics |
| 5. Lazy Dog (OW) | Total Lithics |
| 6. Saamis (OW) | Points |
| 7. Saamis (OW) | Bifaces |

Figure 8. Percentages of Obsidian in selected Late Prehistoric Sites




| SITE | PERCENTAGE OF |
|---|---|
| 1. Avonlea (Av) | Total Lithics |
| 2. Larson (Av) | Total Lithics |
| 3. Garratt (Av) | Debitage |
| 4. Garratt (Av) | Tools |
| 5. Gull Lake (Av) | Points |
| 6. Fantasy (Av) | Points |
| 8. Ramillies (Av/OW) | Total Lithics |
| 9. Estuary (Av/OW) | Total Lithics |
| 10. Empress (Av/OW) | Debitage |
| 11. Empress (Av/OW) | Tools |
| 13. Lazy Dog (OW) | Total Lithics |
| 14. Estuary (OW) | Total Lithics |
| 15. Garratt (OW) | Debitage |
| 16. Garratt (OW) | Tools |
| 17. Gull Lake (OW) | Prairie Points |
| 18. Gull Lake (OW) | Plains Points |
| 19. Saamis (OW) | Points |

Figure 9. Percentages of Petrified Wood in selected Late Prehistoric Sites

## LITHIC ASSEMBLAGES AND TECHNOLOGY

The Avonlea and Old Women's Phase tool assemblages appear to be very similar in morphology and production (Table 17). One would expect that the primary difference would be in projectile point styles, after all, this is how the two phases are defined. Beyond this, there is a slight increase in the frequency of pièces esquillées in Old Women's Phase assemblages. The latter difference may be due to the use of smaller sized raw materials, in particular, local chert, quartzite, and petrified wood pebbles. Through the use of bipolar reduction techniques, these pebbles were employed very effectively to produce pièces esquillées and blanks for endscrapers and points. Although Reeves (1983a:17) argues for the presence of a microlithic, punched blade-core tradition during Avonlea, the data presented here from Avonlea sites do not really support this interpretation.

## CERAMICS

Two conflicting views emerge regarding the differences between Avonlea and Old Women's ceramics. Byrne (1973) argues for a continuity between pottery styles of Early and Late Variants of Saskatchewan Basin Complex ceramics, Avonlea and Old Women's, respectively. This, he concludes, indicates a gradual development from Avonlea to Old Women's.

| SITE | PROJECTILE POINTS | CERAMICS | OTHER TOOLS |
|---|---|---|---|
| Avonlea (Klimko & Hanna 1988; Kehoe et. al. 1988) | Avonlea type pts. | simple-stamped (channeled) sherds; grooved paddle or thong-wrapped paddle sherds | cofes, bifaces, end/sidescrapers, retouched & utilized flakes, bone tools (awls, knives, scrapers), a pecked cobble tool, and a spokeshave. |
| Larson (Milne 1988) | 6 Avonlea pts. 11 Triangular pts. 5 fragments | 5 smooth exterior sherds | pièces esquillées, retouched flakes, cobble choppers, bone tools (awls, punch), graver perforators, a core, endscrapers, bifaces |
| Manyfingers (Quigg 1988b) | 5 Avonlea pts. | 13 deep knotted cord-impressed sherds | cobble choppers, endscrapers, bifaces, bone tools (perforators/awls), uniface |
| Henry Smith Ruebelmann 1988 | Avonlea pts., few Prairie/Plains Side-Notched pts., traingular pts., 1 Besant pt. | 3 parallel grooved sherds | choppers, knives, bone tools (scrapers, fleshers), cores, flake tools, hammerstones, anvils, bifaces gravers, scrapers, spokeshaves |
| Yellowsky (Meyer et al. 1988) | 1 Avonlea pt. (Timber Ridge variety) | 1339 sherds; smoothed net-impressed & smooth exteriors | bifaces, drill, endscrapers, retouched flakes, large cobble tools |

Table 17. Tool Assemblage Data

| SITE | PROJECTILE POINTS | CERAMICS | OTHER TOOLS |
|---|---|---|---|
| Gravel Pit<br>Meyer et al. 1988 | Avonlea Pts. | sherds with smooth brushed exteriors (similar to Laurel ware) & with smoothed net-impressed exteriors | bifaces, end/sidescrapers, retouched flakes, grooved mauls, 2 adze blades, hammerstones |
| Lebret<br>Smith & Walker 1988 | 7 Avonlea pts. | 154 sherds with net-impressed exteriors & smoothed surfaces with faint parallel ridges | bifaces, endscrapers |
| Lost Terrace<br>Davis & Fisher 1988 | 9 Avonlea pts. | ——— | unnotched bifaces, microblade core & tools, retouched flakes, unifaces, preforms, perforator, endscraper, arrow shaft abrader, hammerstone, cobble chopper. |
| Fantasy<br>Tratebas & Johnson 1988 | Avonlea pts. | parallel grooved sherds | endscrapers, bifaces, performs, retouched flakes. |
| Old Women's Jump<br>Forbis 1962 | Old Women's pts.<br>Besant & large dart pts. | 4 sherds with cord roughened exteriors | bifaces, endscrapers, bifacially chipped flakes, choppers, bone awl, hammerstones. |

Table 17 (Cont'd). Tool Assemblage Data

| SITE | PROJECTILE POINTS | CERAMICS | OTHER TOOLS |
|---|---|---|---|
| Lazy Dog<br>Quigg 1978 | 1 Prairie Side-Notched pt. | ——— | bifaces, endscrapers, unifacial knives, retouched flakes, cobble choppers,anvils, pièces esquillées |
| Ellis<br>Brumley 1985 | 2 Old Women's pts.<br>2 Late Preh. frags. | ——— | bifaces, endscrapers, retouched stone tools (knives), cores. |
| Saams<br>Milne 1978 | Prairie/Plains Side-Notched pts.<br>Plains Triangular pts. | Sask. Basin Complex & Cluny Complex ceramics | endscrapers, bifacial knives, cores, perforating tools, pièces esquillées, hammerstones, heavy chipped stone tools, few bone tools. |
| Head-Smashed-In<br>Reeves 1978<br>Brink et al. 1985 | Avonlea Timber Ridge Side-Notched pts.<br><br>Plains/Prairie Side-Notched pts. | Cord Wrapped Stick Impressed, Fabric Impressed, Truncated Cord Marked, Horizontal Dentate Stamped (Sask. Basin & Cluny Complex Ceramics) | bifaces, endscrapers, pièces esquillées, retouched flakes, cobble & flake choppers, anvils, hammerstones.<br><br>bifaces, endscrapers, pièces esquillées, retouched flakes, cobble & flake choppers, anvils, hammerstones, pet. wood tools. |

Table 17 (Cont'd). Tool Assemblage Data

| SITE | PROJECTILE POINTS | CERAMICS | OTHER TOOLS |
|---|---|---|---|
| Ramillies (Brumley 1976a) | Avonlea points (Timber Ridge Side-Notched) Old Women's pts. | 40 sherds, 39 with smooth surface & 1 cord-wrapped stick sherd | bifaces, retouched flake tools, endscrapers, spokeshaves, burin, pièces esquillées, large core tools, bone tools |
| Estuary (Adams 1977) | 31 Avonlea pts. 22 Prairie Side-Notched pts. Prairie Side-Notched pts. | 2 sherds with cord-marked grooves | bifaces, endscrapers, sidescrapers, hammerstone, 1 pièce esquillée, 118 bone tools, unifaces. side/endscrapers, bifaces, unifaces, pièces esquillées, cores, 64 bone tools |
| Morkin (Byrne 1973) | Besant pts. Avonlea pts. Old Women's pts. | Early & Late Variant Sask. Basin Complex ceramics | (no detailed site report) |
| Whakpa Chu'gn (Brumley 1976b; Davis & Stallcop 1966) | Besant pts. Avonlea pts. Plains/Prairie Side-Notched points | Sask. Basin Complex ceramics with Old Women's pts. | bifaces, bone tools (awls, needles), knives, endscrapers, blades |

Table 17 (Cont'd). Tool Assemblage Data

| SITE | PROJECTILE POINTS | CERAMICS | OTHER TOOLS |
|---|---|---|---|
| Balzac Head 1985, 1986 | Avonlea pts.<br>Old Women's pts. | Avonlea: cord-impressed<br>Old Women's: smooth exterior with faint grooves | retouched flakes, bifaces, end/sidescapers, pièces esquillées, cores, drills, gravers, hammerstones, chopper; bone tools. |
| Garratt<br>Morgan 1979 | Besant pts.<br>Avonlea pts.<br>Prairie/Plains Side-Notched pts. | no ceramics<br>Knotted Open Net, Plain, Punctate, Grooved Paddle, Incised.<br>Fabric Impressed, Plain, Cord Impressed. | bifaces, unifaces, heavy stone tools.<br>cores, bifaces, unifaces, endscrapers, pièces esquillées, heavy stone tools, bone tools, shell artifacts.<br>cores, pièces esquillées, bifaces, drills, side/endscrapers, heavy stone tools, bone tools. |
| Gull Lake<br>Kehoe 1973 | Avonlea pts. (Gull Lake, Carmicheal, Timber Ridge)<br>Prairie Side-Notched pts.<br>Plains Side-Notched pts. | no ceramics<br>Cord-Impressed, Plain<br>Fabric Impressed, Incised | quartzite cobble tools, end/side scrapers, stone knives, drills/gravers, hammerstones, pestles, bone tools. |
| Empress<br>Hudecek 1988 | Avonlea (Timber Ridge Side-Notched pts.); Prairie Side-Notched pts; Plains Triang. pts. | 33 sherds with smooth exteriors; 4 fabric/net impressed sherds | bifaces, retouched flakes, endscrapers, pièces esquillées, retouched spalls, hammerstones, anvils. |

Tabel 17 (Cont'd). Tool Assemblage Data

Morgan (1979), on the other hand, argues that this view is based largely on evidence from the Morkin site which displays stratigraphic problems. She maintains that the ceramics at the Garratt site offer no support for the belief that Avonlea and the late side-notched tradition of the Old Women's Phase represent a continuing cultural development.

Byrne (1973:355) describes Avonlea ceramics as characterized by a plain fabric/net impressed exterior, a simple globular or coconut form, and flat or ridged lips with little or no trace of thickening. Decoration is common and usually consists of one or more bands of punctates below the lip. However, recently, excavated assemblages have also revealed parallel grooved ceramics in association with Avonlea points (Davis 1988, editor). Overall, Avonlea ceramics tend to be primarily of the net/fabric or cord impressed and parallel grooved varieties.

The Yellowsky site in northern Saskatchewan has Avonlea ceramics with net-impressed exteriors and a single row of punctates below the lip (Wilson-Meyer and Carlson 1985). At the Mineral Creek and Gravel Pit sites, both also in northern Saskatchewan, ceramics consisted of net-impressed and smoothed net-impressed sherds (Meyer et al. 1988). Net-impressed and smoothed surface ceramics with faint parallel ridges were recovered from the Lebret site in southeastern Saskatchewan (Smith and Walker 1988). These

are similar to those from the Garratt site (Morgan 1979) which included primarily knotted open-net or net-impressed and plain surface varieties with a few incised, punctate, and grooved paddle varieties. Fabric-impressed ceramics were recovered from the Avery site in Manitoba (Joyes 1988) along with several sherds exhibiting parallel grooved surfaces. Parallel grooved pottery has also been recovered from Avonlea assemblages at the TRJ and Fantasy sites (Tratebas and Johnson 1988) and the Henry Smith site (Ruebelmann 1988), all in northern Montana. Other types of pottery found associated with Avonlea assemblages include cord-impressed varieties from the H.M.S. Balzac site in Alberta (Head 1985) and the Manyfingers site in southwestern Alberta (Quigg 1988b), and smoothed exterior ceramics from the Larson site in southeastern Alberta (Milne 1988). Ceramics from the Avonlea type site in Saskatchewan (Hanna 1985) exhibit simple stamped exterior surfaces, suggesting paddling with a grooved or thong-wrapped paddle.

Ceramics from Old Women's and mixed Avonlea/Old Women's assemblages appear to be generally quite similar to Avonlea ceramics. At the Old Women's site, ceramics exhibited cord-roughened exteriors (Forbis 1962). Old Women's ceramics from the H.M.S. Balzac site (Head 1985) exhibited smooth exterior surfaces with faint suggestions of grooved exterior

impressions. The Garratt site in Saskatchewan (Morgan 1979) produced fabric-impressed, plain, and cord-impressed ceramics in Old Women's assemblages. A similar variety was recovered from the Gull Lake site (Kehoe 1973): earlier cord-impressed and plain ceramics changing to fabric-impressed and incised pottery in later Old Women's levels.

The mixed Avonlea/Old Women's assemblage at the Empress site (Hudecek 1988) had both smooth exterior and fabric/net impressed ceramics. Ceramics exhibiting smooth surfaces and one with evidence of a cord-wrapped rod decoration were recovered from the Ramillies site in southeastern Alberta (Brumley 1976a). The mixed Avonlea/Old Women's assemblage at the Estuary site in southwestern Saskatchewan produced only two sherds, both with cord-marked grooves on their exterior surfaces (Adams 1977).

From the sample presented here, it appears that Avonlea and Old Women's ceramics are quite similar in construction, with possibly a slight difference in the relative frequency of the surface finishing techniques and decoration patterns used. Petrographic analysis of both Avonlea and Old Women's ceramics indicates only minor variations in manufacturing techniques through time (Quigg 1988a:74). It seems logical, therefore, to conclude that Avonlea and Old Women's ceramics represent a relatively

continuous development with occasional stylistic changes in surface decoration.

## SUMMARY

There are no significant differences between the Avonlea and Old Women's Phases' subsistence and settlement patterns. This simply reflects, however, the uniform subsistence and settlement patterns throughout Plains prehistory (Michlovic 1986). Features such as hearths and pits also appear to be similar from the Avonlea to the Old Women's Phase. Basin-shaped hearths, excavated pits, and fire-broken rock concentrations, indicate that cooking activities, meat and food processing, hide processing and other associated camp activites were similar during both phases (Table 18).

Even radiocarbon dates indicate an overlap between the two phases (see Morlan 1988). Radiocarbon dates of Besant, Avonlea, and Old Women's sites in Alberta exhibit great overlap (Vickers 1983; Figures 25, 26 and 27). While Old Women's dates range from approximately A.D. 800 to A.D. 1800, Avonlea dates cover the time span of A.D. 200 to A.D. 1400, and Besant ages range from approximately A.D. 1 to A.D. 800 (Vickers 1983).

An overall examination of Avonlea radiocarbon dates for the Northwestern Plains (Tables 19 and 21; Figures 10 and12-15) reveals a very

| SITE | HEARTHS | | PITS | | | TIPI RINGS | CAIRNS | KILL AREA | | DRIVE LANES | FBR CONC. | BONE FRAG. | | BUTCHERED BONE | BONE BEDS | LITHIC DEBITAGE | MAJOR ACTIVITIES |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Basin-Shaped | Other | Roasting | Stone Boiling | Debris/Other | | | Pound | Jump | | | Burnt | Unburnt | | | | |
| AVONLEA | | | | | | | | | | | | | | | | | |
| Avonlea | x | | | x | x | | | | | | x | x | x | x | | x | Secondary butchering; food processing and cooking; hide preparation; minor tool production (Kehoe et al. 1988; Klimko & Hanna 1988). |
| Larson | | x | x | x | | | | | | | x | x | x | x | | x | Food procurement & preparation; grease rendering; tool manufacture and repair; hide working (Milne 1988). |
| Manyfingers | | | | | x | | | | | | x | x | x | x | | x | Meat/food processing; limited tool manuf. & hide working (Quigg 1988b). |
| Yellowsky | x | x | | | | | | | | | x | x | x | x | | x | Ceramic/tool manuf.; camp & possibly ceremonial activities (Wilson-Meyer & Carlson 1985). |

Table 18. Features and Activities

| SITE | HEARTHS: Basin-Shaped | HEARTHS: Other | PITS: Roasting | PITS: Stone Boiling | PITS: Debris/Other | TIPI RINGS | CAIRNS | KILL AREA: Pound | KILL AREA: Jump | DRIVE LANES | FBR CONC. | BONE FRAG: Burnt | BONE FRAG: Unburnt | BUTCHERED BONE | BONE BEDS | LITHIC DEBITAGE | MAJOR ACTIVITIES |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AVONLEA Henry Smith | | | | | | x | x | x | | x | | | | x | x | x | Pounding & butchering of bison; tool manuf. & sharpening (Ruebelmann 1988). |
| Lebret | | x | | | | | | | | | | x | x | x | | x | Tool manuf.; hide working; food processing (insufficient data) (Smith & Walker 1988) |
| Lost Terrace | x | | | | x | | | | | | x | x | x | x | | x | Food processing (pronghorn); tool manuf. & resharpening; cutting; large midden (Davis & Fisher 1988). |
| Fantasy, Beaver Bend and TRJ | | x | | | | x | | | x | x | x | | | x | x | | Kill, butchering, and camp activities (only preliminary surveys) (Tratebas & Johnson 1988). |

Table 18 (Cont'd). Features and Activities

| SITE | HEARTHS | | PITS | | | TIPI RINGS | CAIRNS | KILL AREA | | DRIVE LANES | FBR CONC. | BONE FRAG. | | BUTCHERED BONE | BONE BEDS | LITHIC DEBITAGE | MAJOR ACTIVITIES |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Basin-Shaped | Other | Roasting | Stone Boiling | Debris/Other | | | Pound | Jump | | | Burnt | Unburnt | | | | |
| OLD WOMENS | | | | | | | | | | | | | | | | | |
| Old Women's Jump | | | | | | | | | x | x | | | | | x | | Driving of bison & primary butchering (insufficient data) (Forbis 1962) |
| Lazy Dog | | | | | | x | x | | | | x | | | | | x | Tool manuf.; limited cooking activities (lack of bone, hearths, pits; Quigg 1978) |
| Ellis | | | | | | x | x | | | | x | | | x | | x | Tool manuf.; food processing; burial & ceremonial activities (Medicine Wheel, human burial; Brumley 1985) |
| Saamis | x | x | | x | x | | | | | | x | | | x | | x | Butchering; meat processing; and tool manuf. (Milne 1978). |

Table 18 (Cont'd). Features and Activities

| SITE | HEARTHS | | PITS | | TIPI RINGS | CAIRNS | KILL AREA | | DRIVE LANES | FBR CONC. | BONE FRAG. | | BUTCHERED BONE | BONE BEDS | LITHIC DEBITAGE | MAJOR ACTIVITIES |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Basin-Shaped | Other | Roasting | Stone Boiling | Debris/Other | | Pound | Jump | | | Burnt | Unburnt | | | | |
| MULTI-OCCUPATION Head-Smashed-In | | x | x | x | x | x | | x | x | x | x | x | x | x | x | Driving of bison; butchering & meat processing; tool manuf. (Reeves 1978; Brink et al. 1985). |
| Ramillies | x | | | | x | x | x | | x | x | x | x | x | x | x | Pounding of bison; butchering & meat processing; tool manuf. (Brumley 1976a). |
| Estuary | x | x | | | x | | x | | | x | x | x | x | x | x | Pounding of bison; butchering & meat processing; tool manuf. (Adams 1977). |
| Whakpa Chu'gn | | x | | | x | | x | | | | x | | x | x | x | Pounding of bison; butchering & meat processing (bone middens); camp activities (Brumley 1971). |

Table 18 (Cont'd). Features and Activities

| SITE | HEARTHS: Basin-Shaped | HEARTHS: Other | PITS: Roasting | PITS: Stone Boiling | PITS: Debris/Other | TIPI RINGS | CAIRNS | KILL AREA: Pound | KILL AREA: Jump | DRIVE LANES | FBR CONC. | BONE FRAG.: Burnt | BONE FRAG.: Unburnt | BUTCHERED BONE | BONE BEDS | LITHIC DEBITAGE | MAJOR ACTIVITIES |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MULTI OCCUPATION | | | | | | | | | | | | | | | | | |
| Balzac | x | | | | x | | | | | | x | x | x | x | | x | Camp activities; butchering & meat and hide processing; tool manuf. (Head 1985). |
| Garratt | | x | | | x | x | | | | | x | | | x | | x | Camp activities (insufficient data on specific features) (Morgan 1979). |
| Gull Lake | | | | | | x | | | x | | | x | x | x | | x | Driving of bison; butchering & meat processing; associated camp activities (insufficient data on features) (Kehoe 1973). |
| Empress | x | x | | | x | x | x | | | | x | x | x | x | | x | Secondary butchering & meat processing; major tool manuf. (Reeves 1977; Hudecek 1988). |

Table 18 (Cont'd). Features and Activities

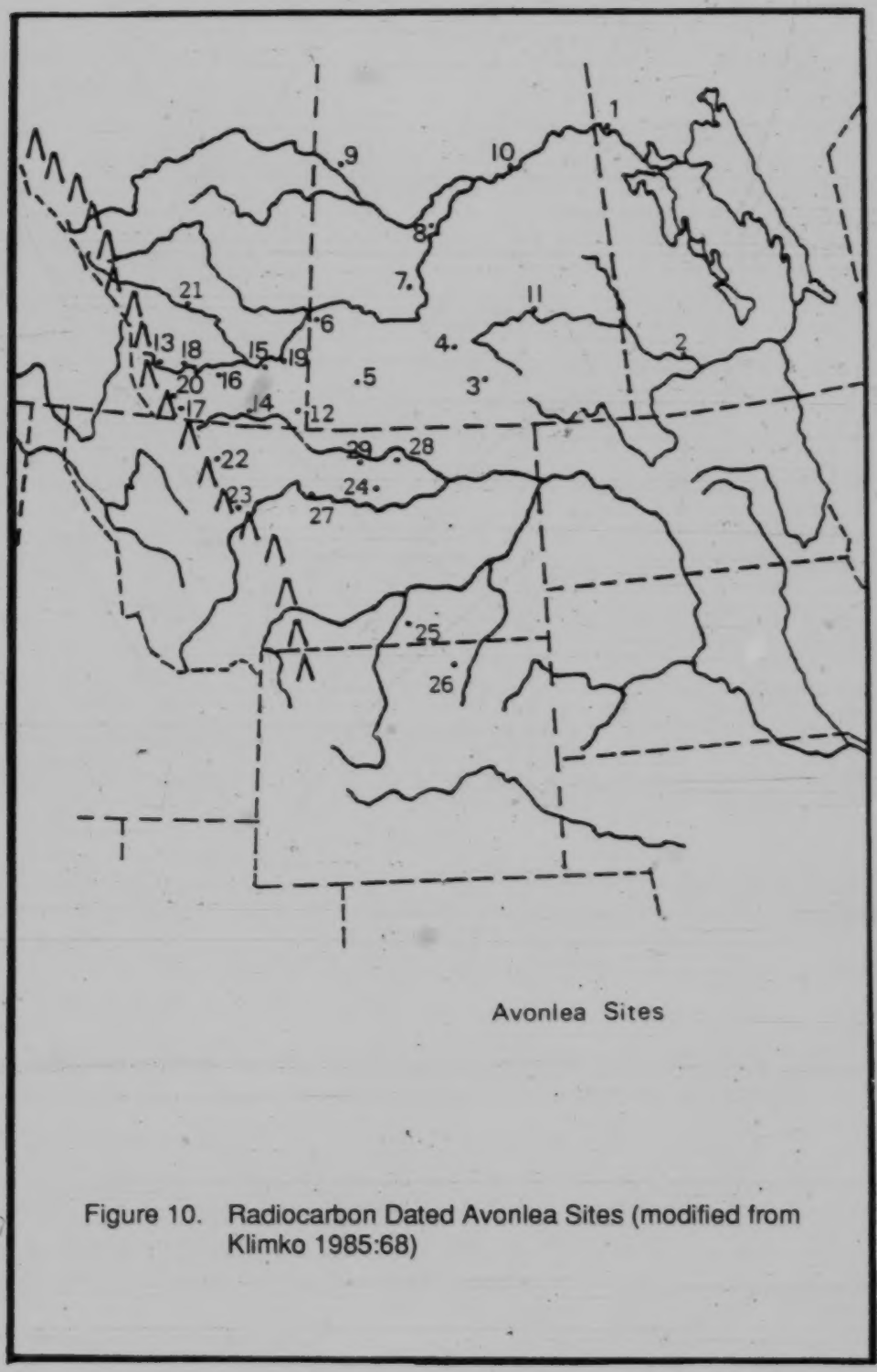



Figure 10. Radiocarbon Dated Avonlea Sites (modified from Klimko 1985:68)

| AVONLEA SITE | DATE | SOURCE |
|---|---|---|
| **Manitoba** | | |
| 1. The Pas Reserve FlMh-1 | A.D. 975±150 | Joyes 1988 |
| | A.D. 625±100 | |
| 2. Stott DlMa-1 | A.D. 975±150 | Joyes 1988 |
| | A.D. 840±60 | |
| **Saskatchewan** | | |
| 3. Avonlea EaNg-1 | A.D. 450±100 | Kehoe & McCorquodale 1961 |
| | A.D. 385±205 | Klimko & Hanna 1988 |
| 4. Garratt EcNj-7 | A.D. 500±70 | Morgan 1979 |
| | A.D. 670±60 | |
| 5. Gull Lake EaOd-1 | A.D. 660±60 | Kehoe 1973 |
| | A.D. 210±60 | |
| 6. Estuary EfOk-6 | A.D. 760±165 | Adams 1977 |
| | (Avonlea & Old Women's) | |
| 7. Sjovold EiNs-4 | A.D. 570±190 | Dyck 1983 |
| | A.D. 575±195 | |
| 8. Roussell FbNs-2 | A.D. 765±70 | Dyck 1983 |
| 9. Yellowsky FjOd-2 | A.D. 1230±135 | Meyer et al. 1988 |
| 10. Gravel Pit FhNa-61 | A.D. 1135±135 | Meyer et al. 1988 |
| 11. Lebret EeMw-26 | A.D. 690±115 | Smith & Walker 1988 |
| **Alberta** | | |
| 12. Irvine Kill DlOn-2 | A.D. 770±140 | Brumley & Rushworth 1983 |
| 13. Morkin DlPk-2 | A.D. 745±90 | Byrne 1973 |
| | A.D. 760±130 | |
| 14. DlPk-3 | A.D. 625±120 | Brumley & Rushworth 1983 |
| 15. EcOs-41 | A.D. 1010±110 | Klimko 1985 |
| 16. Upper Kill DlPd-1 | A.D. 1095±90 | Byrne 1973 |
| 17. DkPi-2 | A.D. 1320±110 | Brumley & Rushworth 1983 |
| 18. Head-Smashed-In DkPj-1 | A.D. 950±110 | Reeves 1978 |
| | A.D. 910±140 | |
| | A.D. 305±140 | |
| | A.D. 110±90 | |
| | A.D. 90±120 | |
| 19. Larson DlOn-3 | A.D. 530±150 | Milne 1988 |
| | A.D. 785±125 | |
| 20. Manyfingers DhPj-31 | A.D. 875±90 | Quigg 1988b |
| | A.D. 850±85 | |
| 21. Balzac EhPm-34 | A.D. 670±50 | Head 1985 |
| | A.D. 410±50 | |

Table 19. Avonlea Radiocarbon Dates

| AVONLEA SITE | DATE | SOURCE |
|---|---|---|
| **Montana/Wyoming** | | |
| 22. Big Badger | A.D. 450 | Johnson 1970 |
| 23. Crawford | A.D. 250 | Johnson 1970 |
| 24. Timber Ridge | A.D. 150 | Davis 1966 |
| | A.D. 650 | |
| 25. Mangus III | A.D. 640±100 | Johnson 1970 |
| 26. PK Ranch | A.D. 1050±240 | Reeves 1983a |
| 27. Lost Terrace 24CH68 | A.D. 950±180 | Davis & Fisher 1988 |
| | A.D. 840±100 | |
| 28. Henry Smith 34PH794 | A.D. 910±110 | Ruebelmann 1988 |
| | A.D. 930±100 | |
| | A.D. 1040±100 | |
| 29. Fantasy Kill 24PH1324 | A.D. 930±100 | Tratebas & Johnson 1988 |

Table 19 (cont'd). Avonlea Radiocarbon Dates

| REGION | COMPLEX | DATE RANGE |
|---|---|---|
| **Upper Saskatchewan Basin** -from the Rocky Mountains to 108th meridian (Swift Current Saskatchewan). | Besant | 400 B.C. to A.D. 700 |
| | Avonlea | A.D. 100 to A.D. 1100-1300 |
| | Old Women's | A.D. 800 to A.D. 1600-1700 |
| **Middle Saskatchewan and Assiniboine Basins** - South Saskatchewan River and its tributaries from 108th meridian to Saskatoon; Qu'Appelle River and other tributaries of the Assiniboine in SE Saskatchewan. | Besant | 30 B.C. to A.D. 400-500 |
| | Avonlea | A.D. 200 to A.D. 900 |
| | Old Women's | A.D. 700 to A.D. 1700 |
| **Lower Saskatchewan Basin** - mainstem of Saskatchewan River and up the North Saskatchewan Valley. | Avonlea | A.D. 1100 to A.D. 1300 |
| **Missouri Basin** - Montana, east of the Continental Divide, extending into North and South Dakota. | Besant | 300 B.C. to A.D. 800-900 |
| | Avonlea | A.D. 500 to A.D. 1100 |
| | Old Women's | A.D. 1000 to A.D. 1700 |
| **Kootenai Basin** - in Montana and British Columbia | Avonlea | A.D. 8-900 to A.D. 13-1400 |

Table 21. Radiocarbon Date Ranges (data from Morlan 1988)

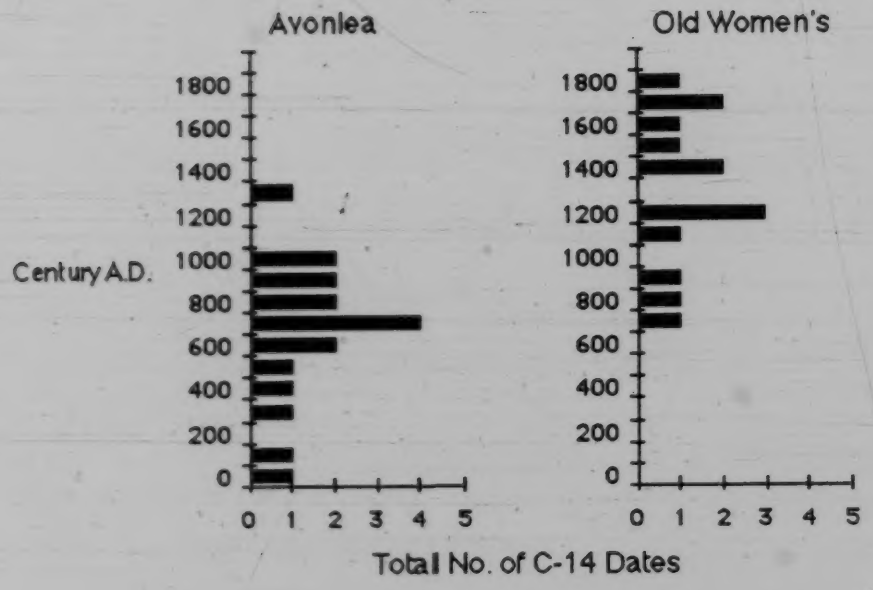



Figure 12. Number of Radiocarbon Dates Per Century from Alberta Late Prehistoric Sites

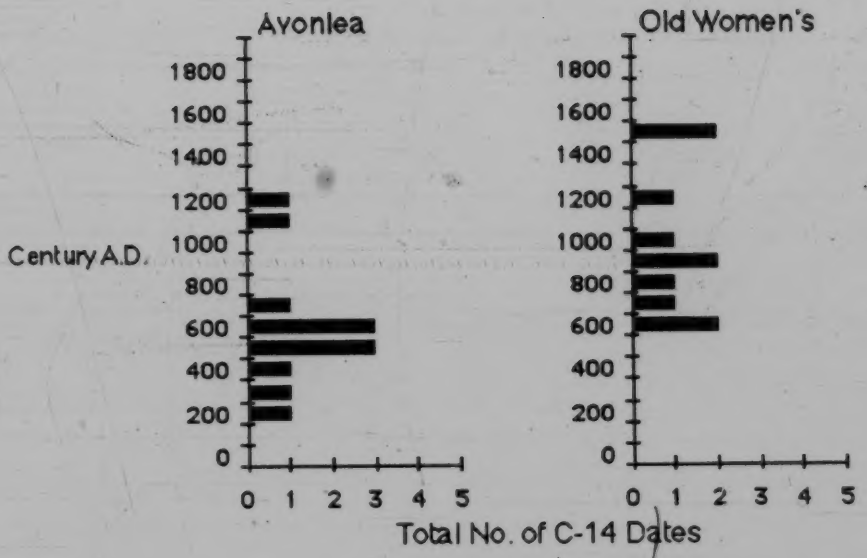



Figure 13. Number of Radiocarbon Dates Per Century from Saskatchewan Late Prehistoric Sites

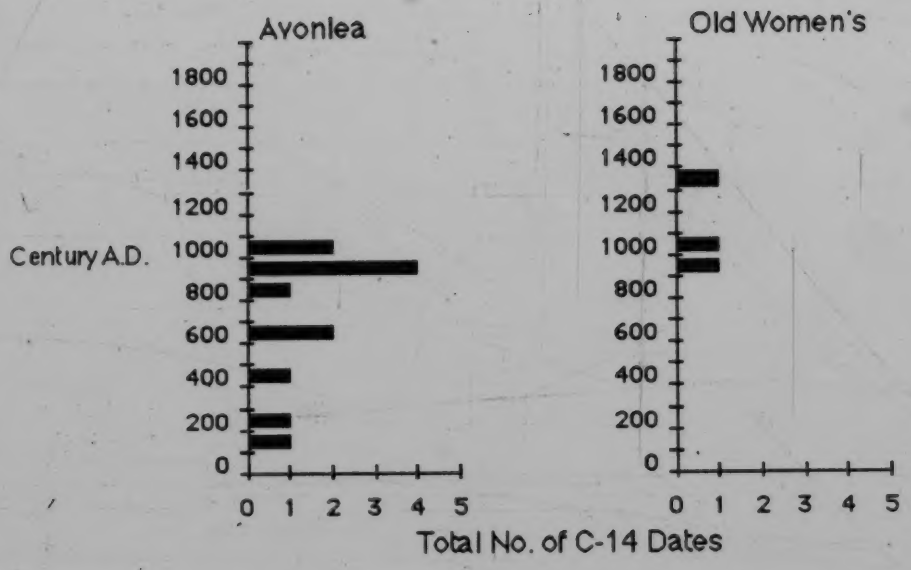



Figure 14. Number of Radiocarbon Dates Per Century from Montana Late Prehistoric Sites

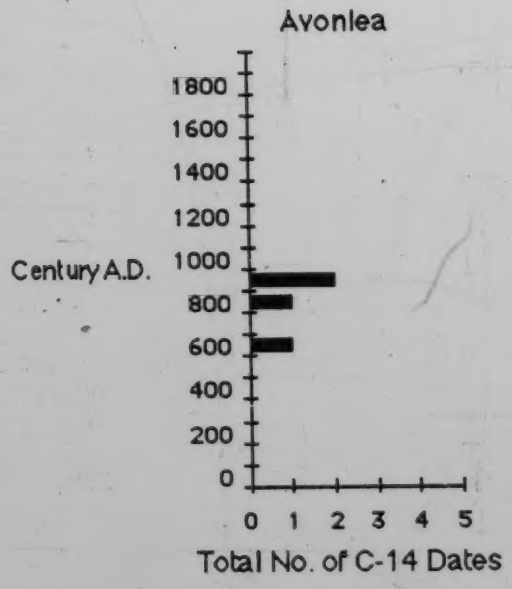



Figure 15. Number of Radiocarbon Dates Per Century from Manitoba Late Prehistoric Sites

faint general westward and northward movement of Avonlea as Klimko (1985) and Morgan (1979) have suggested, with slightly earlier dates for Avonlea appearing in the east and south. However, I believe this hypothesis is still very speculative. Concerning the Old Women's Phase, a review of radiocarbon dates (Tables 20 and 21; Figures 11-15) indicates no apparent geographic distribution of the dates that might suggest origins or population movements. Combining radiocarbon dates for both Avonlea and Old Women's sites from Alberta, Saskatchewan, Manitoba, and Montana (Tables 19 and 20), shows an overlap of 700 to 800 years (Figure 16). This observation leads to the conclusion that the change from the Avonlea Phase to the Old Women's Phase was temporally gradual, not sudden or sharp. Perhaps, however, an examination and evaluation of the materials used for various radiocarbon dates, some materials producing more reliable dates that others, may provide a different temporal picture, with less overlap between the two phases.

In summary, no major change in lithic resource utilization or artifact inventory occurred between the Avonlea and Old Women's phases. Instead, the shift from one phase to the other is based on a change in point styles and changes in the surface decoration on ceramics.

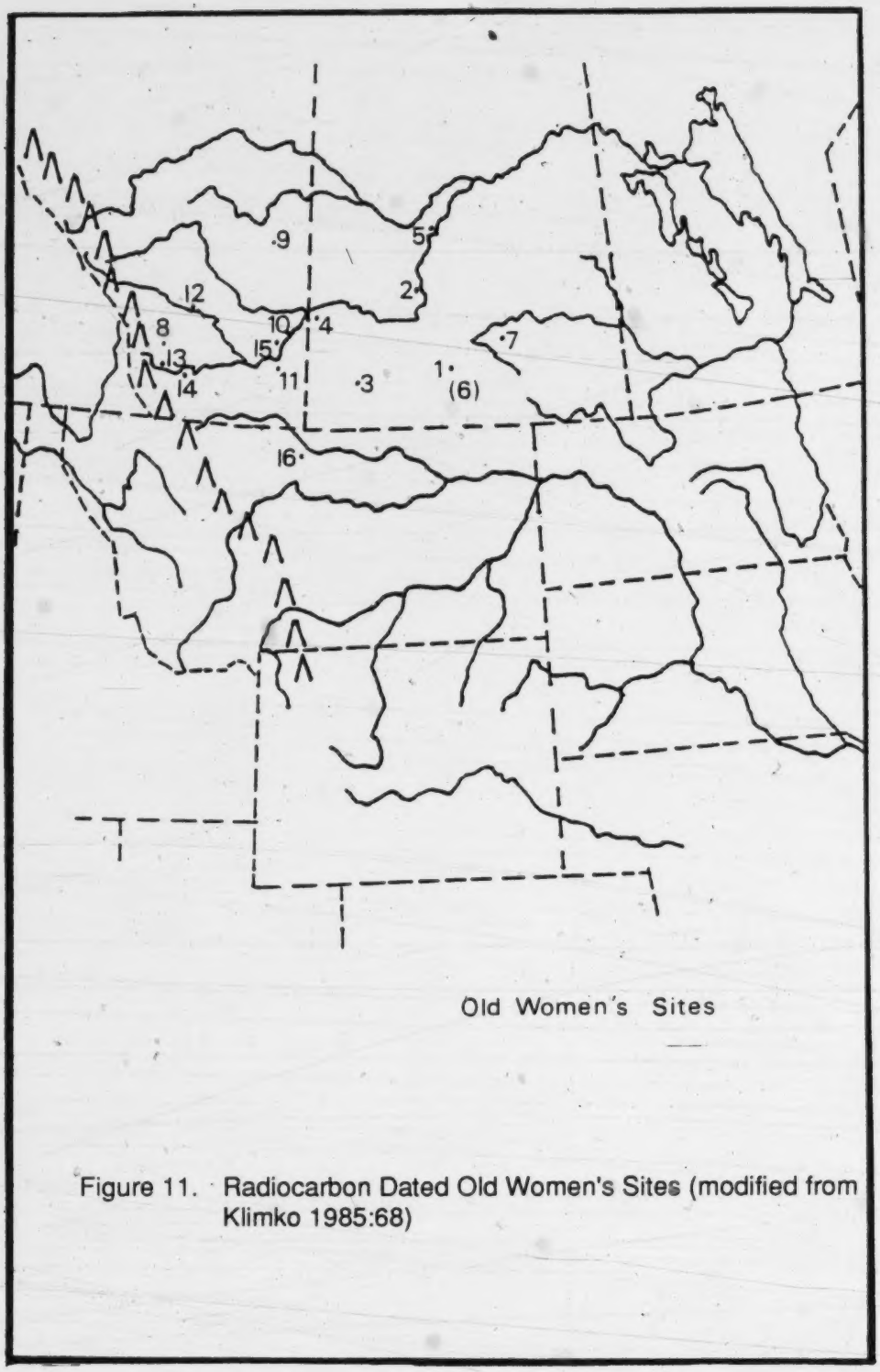



Figure 11. Radiocarbon Dated Old Women's Sites (modified from Klimko 1985:68)

| OLD WOMEN'S SITE | DATE | SOURCE |
|---|---|---|
| **Saskatchewan** | | |
| 1. Walter Felt (Prairie) | A.D. 690±70 | Dyck 1983 |
| | A.D. 1250±80 | |
| 2. Sjovold (Prairie) | A.D. 630±190 | Dyck 1983 |
| 3. Gull Lake (Prairie) | A.D. 730±80 | Kehoe 1973 |
| 4. Estuary (Prairie) | A.D. 930±80 | Adams 1977 |
| | A.D. 880±70 | |
| | A.D. 760±165 | (Avonlea and Old Women's) |
| 5. Tschetter (Prairie) | A.D. 1035±45 | Dyck 1983 |
| | A.D. 945±75 | |
| 6. Walter Felt (Plains) | A.D. 1550±40 | Dyck 1983 |
| 7. Lake Midden (Plains) | A.D. 1570±100 | Dyck 1983 |
| **Alberta** | | |
| 8. Old Women's EcPl-1 | A.D. 940±80 | Forbis 1962 |
| | A.D. 860±80 | |
| 9. Lazy Dog FbOr-57 | A.D. 1475±50 | Quigg 1978 |
| 10. Eliis EcOp-4 | A.D. 1430±160 | Brumley 1985 |
| 11. Saamis EaOp-6 | A.D. 1740±80 | Milne 1978 |
| | A.D. 1515±125 | |
| 12. Balzac EhPm-34 | A.D. 1630±50 | Head 1985 |
| 13. Morkin DlPk-2 | A.D. 1845±90 | Byrne 1973 |
| | A.D. 1700±95 | |
| | A.D. 1155±85 | |
| | A.D. 1250±90 | (Avonlea & Old Women's) |
| | A.D. 1280±95 | |
| 14. Head-Smashed-In DkPj-1 | A.D. 1250±170 | Reeves 1978 |
| | A.D. 760±90 | |
| 15. Ramillies EcOr-35 | A.D. 1290±115 | Brumley 1976a |
| | A.D. 985±65 | (Avonlea and Old Women's) |
| **Montana** | | |
| 16. Whakpa Chu'gn 24HL101 | A.D. 1390±90 | Brumley 1975 |
| | A.D. 1020±100 | |
| | A.D. 960±100 | |

Table 20. Old Women's Radiocarbon Dates

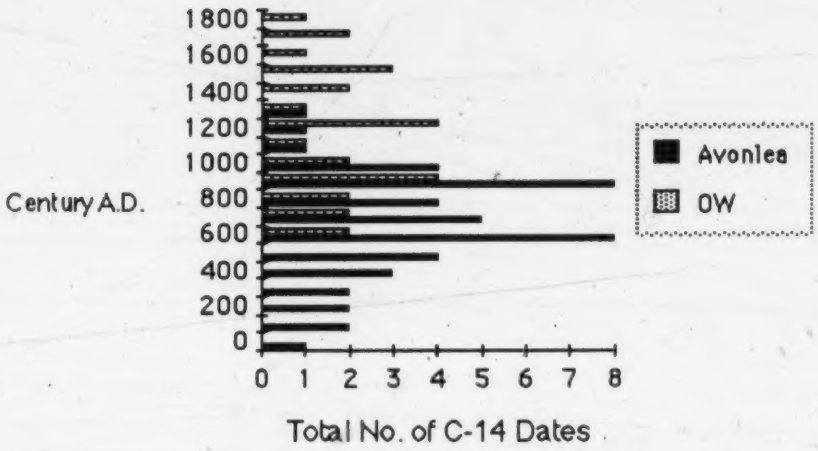



Figure 16. Number of Radiocarbon Dates Per Century of Late Prehistoric Sites in Alberta, Saskatchewan, Manitoba, and Montana

# CHAPTER FOUR

# EVALUATION OF THEORIES REGARDING AVONLEA AND OLD WOMEN'S PHASES

## INTRODUCTION

Numerous theories have been proposed to account for both the origins of and relationship between the Avonlea and Old Women's Phases. The purpose of this chapter is to review these theories and critically compare and evaluate them on the basis of the archaeological database presented in the previous chapter.

## THE AVONLEA PHASE

### Early Views of Avonlea

Mulloy (1958:163) was the first to assign the small triangular side-notched projectile points of the Northern Plains to the Late Prehistoric period. Specifically, the Avonlea variety of the Late Prehistoric points was first described in published literature by Wettlaufer (1960) for the Avonlea

culture in level two at the Long Creek Site. Forbis (1960) also found the Avonlea component at the Upper Kill site near Coaldale, but named the points Upper Kill points. It was not until 1961 that the Avonlea point and phase were described in detail by Kehoe and McCorquodale (1961). They coined the term Avonlea to describe the small triangular, thin side-notched projectile point found at the Avonlea site, a bison trap in southern Saskatchewan. They also noted that:

> the most distinguishing feature of the Avonlea point is its delicate aspect, produced by the thinness of the blank struck off for the point. Flaking on the Avonlea points is extraordinarily well-executed, contributing to the delicacy of the projectile point. Flake scars are very broad and shallow, usually parallel, and extend from the edge of the blade to the mid-point or beyond... Small, shallow, but fairly wide side notches are always symmetrically opposed and equidistant from the base... The edges of the triangular blade are very regular, and frequently exhibit fine serration. The base may be wide, equal to, or narrower than the proximal end of the blade; no preference is apparent. Usually, the corners of the base are rounded, rather than sharp, and since the bases are preponderately concave, small ears are typical, projecting at about a 65 degree angle to the longitudinal axis of the point... (Kehoe and McCorquodale 1961:184)

Kehoe and McCorquodale (1961:179) suggested that the centre of the Avonlea point's distribution was southwestern Saskatchewan. In this "hearth" area, the Avonlea point seemed to be the longest, the length-width ratio the

greatest, ground bases more often encountered, and the notches were shallower (Ibid:186). They also argued that Avonlea points were only located in preceramic layers and associated with bison kill sites (Ibid). According to Kehoe and McCorquodale (1961:186), Avonlea people were unfamiliar with exotic materials such as KRF and thus depended heavily on local lithic resources. They concluded that the first occurrence of Avonlea points introduced the Late Prehistoric period, a time of great herds of bison and communal bison hunting on the Northwestern Plains, and were horizon markers for the early Late Prehistoric period on the Northwestern Plains (Kehoe and McCorquodale 1961:187).

In 1966, Kehoe (1966:830), described the Small Side-Notched point system in the Northern Plains, suggesting three varieties of Avonlea points: Gull Lake Classic Avonlea, Carmichael wide-eared variety, and the Timber ridge sharp-eared variety (Figure 17). He suggested that the Timber Ridge sharp-eared variety was a late development out of the Gull Lake Classic variety, since the Timber Ridge point is essentially similar to the Gull Lake type except for its larger size.

In 1966, Davis expanded the range of the Avonlea point into Montana. He described Avonlea sites as extending from the foothills of the Rocky Mountains, spreading 800 km east onto the Plains, northward into the

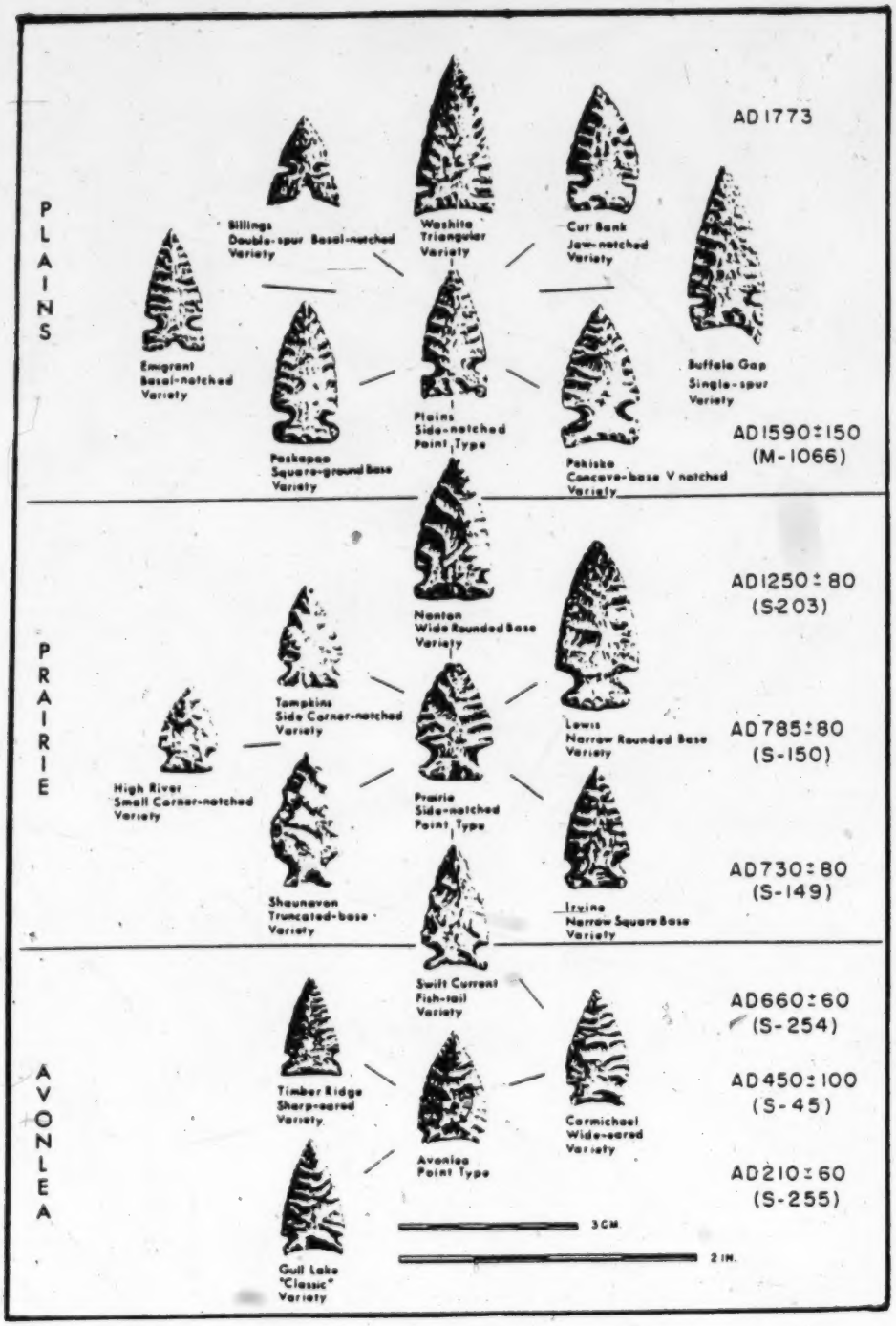



Figure 17. Kehoe's Small Side-Notched Point System of the Northern Plains (Kehoe 1973; reproduced with permission of the author)

northern forests and southward beyond the Missouri River (Davis 1966:109). Also, Davis (1966:112) argued that Avonlea points on the southern periphery of the "hearth" area were not less true to type than the classic Avonlea as was suggested by Kehoe and McCorquodale (1961).

The Origins and Internal Development of Avonlea

A number of theories have been proposed by various investigators to account for the origins and development of Avonlea on the Northern Plains.

Kehoe. In 1966, Kehoe (1966:839) postulated that Athapaskan invaders skilled in caribou driving, moved onto the prairies, displacing the indigenous Besant peoples, bringing with them the Avonlea point and tool kit. Kehoe further developed this hypothesis, suggesting that the entire Avonlea Phase was the result of a population migration of Athabascans from the northern Canadian Boreal forest, and that it corresponded to the first occurrence of ritualized communal bison hunting on the Northwestern Plains (Kehoe and Kehoe 1968:28-30).

There is now, however, much evidence to suggest that large communal bison kills were conducted on the Plains prior to the Avonlea Phase. Excavations at Head-Smashed-In Buffalo Jump and Olsen-Chubbuck sites indicate that Plains Indians were driving bison as early as 5500 B.P., if not

earlier (Reeves 1978; Wheat 1967,1972). Furthermore, Kehoe's conclusions seem to be based on speculations generated by reconstructions of proto-Athabascan language patterns (Byrne 1973:456). In addition, Kehoe (Kehoe & McCorquodale 1961:186) argued that Avonlea was a non-ceramic phase, but Byrne (1973:457) found the Early Variant of the Saskatchewan Basin ceramic complex associated with the Avonlea assemblages in sites in both southern Alberta and Saskatchewan.

Reeves. In 1970, Reeves attempted to synthesize the Avonlea data (Reeves 1970), speculating that Avonlea Phase peoples were the first to use the bow and arrow on the Northwestern Plains (Reeves 1983a:162). According to him, Avonlea appeared on the Plains as early as A.D. 150-250, and was replaced by Old Women's peoples around A.D. 700. Reeves (1983a:61) divided Avonlea points into two types based on those from the Head-Smashed-In Buffalo Jump. These are distinguished on the basis of shoulder shapes: Head-Smashed-In Corner Notched points are earlier and have acute or barbed shoulders, while Timber Ridge Side-Notched points are later and characterized by obtuse shoulders.

As already mentioned, Reeves (1983a:46-47) proposed two cultural traditions for the Plains: the TUNAXA and the NAPIKWAN. The indigeneous Tunaxa, purportedly a widespread hunting and gathering tradition, consisted

of a series of regionally adapted societies present on the Northern Plains for at least 2500 years; these include McKean, Hanna, Pelican Lake and Avonlea Phases. Around A.D. 200, the Tunaxa tradition continues as a hunting and gathering adaptation into the Avonlea Phase. According to Reeves (1983a:166), the Avonlea Phase, marking the end of the Tunaxa tradition, developed out of the Pelican Lake Phase as a result of diffusion of the bow and arrow from interior British Columbia and ceramics from the east. Reeves (1983a:163) bases his conclusions on evidence that suggests that notched arrowheads appear earlier in the mountain areas of British Columbia while ceramic technology appears earlier in the east and then diffused from these areas, onto the Plains.

On the other hand, the Napikwan tradition, according to Reeves (1983a:185), was a resident Plains tradition on the northeastern periphery since approximately 500 B.C. As a result of contact and participation in the Hopewellian Interaction Sphere, Napikwan social organization and communication systems changed, allowing for the physical expansion of Napikwan populations westward onto the Missouri and upriver into the Missouri and Saskatchewan basins, eventually appearing around A.D. 1-200 on the Northwestern Plains as the Besant Phase (Reeves 1983a:191-192). With its more complex social organization (i.e., development of ranking and

high status), and its well developed and strong lines of communication, trade, and transport (i.e., Reeves speculates that Besant peoples had new methods of water transport), the Napikwan Besant tradition was able to physically dominate and displace resident Avonlea populations for a short time from A.D. 1 to A.D. 250, from parts of the Northern Plains (Reeves 1983a:185-192). This expansion of Besant populations gave them access to the obsidian and KRF quarries and the bison-rich country of the Northwestern Plains. Reeves (1983a:190) even postulated that Besant peoples penetrated the plains due to pressure by high status groups to gain control of the economic resources which were being traded into the Hopewellian centres.

A major problem with this model is that based only on Besant's occasionally extensive use of KRF, and Avonlea's apparent emphasis on local lithics, Reeves (1983a:189-192) fabricated a scenario where the "superior" communication systems of Besant enabled them to dominate over Avonlea populations. However, there is adequate evidence that Avonlea populations did in fact utilize KRF. Furthermore, because Avonlea populations emphasized local lithics, this does not necessarily mean that they had inferior communication, but instead were possibly better adapted and more knowledgable of the resources of the region. It is possible that Avonlea did have complex trading networks with outlying areas, but in organic goods,

which have long since perished due to adverse preservation conditions.

However, according to Reeves (1983a:185-192), Besant population and technology were inadequate to completely displace the entire indigenous Avonlea population, resulting in the two cultures coexisting in time and space, each maintaining its own cultural identity for some 500 years on the Plains till A.D. 700. Avonlea termination dates vary. In Saskatchewan, Avonlea points are replaced around A.D. 700-800, whereas later termination dates occur to the west and south. Reeves (1983a:16) suggests a termination date of A.D. 900-1100 for the Avonlea Phase and replacement by Old Women's Phase in the southern Alberta plains and foothills.

Byrne. In 1973, Byrne analyzed Southern Alberta prehistory based on the ceramic evidence. He divided southern Alberta pottery into three periods.

Period I (A.D. 150-250- A.D. 1150) ceramics are referred to as Saskatchewan Basin Complex-Early Variant and are associated primarily with Avonlea points and the beginning of the Late Prehistoric period on the Northwestern Plains. The ceramics are characterized by simple coconut-shaped vessels with plain fabric/net impressed surface finishes, unthickened flat or ridged lips and decorative punctates on the rim surface. Byrne (1973:383-385) suggested a derivation of the early variant from Avonlea ceramics in south-central Saskatchewan with distant relationships to

Laural pottery from Manitoba.

Period II (A.D. 1150-1700) ceramics encompass the last half of the Late Prehistoric period and are classified as Saskatchewan Basin Complex-Late Variant. They are similar to the early variant, but with several additional features of vessel and rim form, surface finish, and decorative techniques. Late Variant ceramics are associated with Late Side-notched points of the Old Women's Phase.

Period III (A.D. 1700-1870) ceramics are associated with the Protohistoric period and include both Saskatchewan Basin Complex- Late Variant and the Cluny Complex types present with Late Side-Notched points and Historic trade goods (Byrne 1973:453). Cluny complex ceramics are found at several kill and campsites throughout southern Alberta and are associated with Old Women's material. Both Byrne (1973) and Forbis (1977) saw the Cluny complex as representing a group with cultural origins in the Middle Missouri area of the Dakotas, who moved into Alberta during the Protohistoric, then died out, moved back, or were absorbed by the local Old Women's population.

At the Morkin site, a Late Prehistoric buried campsite in southwestern Alberta, Byrne (1973:245-246) found three types of Side-Notched points. An early U-shaped or open form of notching was in the process of evolving into

the later rectangular or closed form with the intermediate or V-shaped notched points representing a transitional stage. Based on this and other non-ceramic data, Byrne (1973:456) argued that there is little to support Kehoe's migration theory for the origin of the Avonlea Phase, but much to support Reeves' hypothesis of in situ development of the Avonlea Phase from the Pelican Lake Phase. Based on ceramic evidence, however, Byrne (1973:465) believed that Besant or the Napikwan tradition's participation in the Hopewellian Interaction sphere was not as significant as Reeves (1983a) postulated. In a review of site collections from southern Alberta, Byrne (1973:446) found no single instance which conclusively reflected pottery in association with Besant. Byrne (1973:466) suggested instead that Besant may represent the movement of non-pottery using peoples who came from the northern Boreal forest into Manitoba and then subsequently expanded south and west. However, as Dyck (1983:120) pointed out, despite scepticism about the association of ceramics with Besant components in the Canadian Plains, there are now several occurrences of pottery with Besant levels in Saskatchewan (Garratt, Long Creek, Walter Felt, and Intake sites), as well as eastern Montana, and North and South Dakota.

Adams. Adams (1977) along with Byrne (1973), supported Reeves' hypothesis for Avonlea origins. He described the Avonlea Phase as

> ... an indigenous phase that developed from the Late Middle Prehistoric Pelican Lake phase and reacted to the introduction of the bow and arrow form the west and pottery from the east. It seemed to develop in the Saskatchewan Basin between A.D. 150 and A.D. 250, then spread westward to the foothills and south to the Montana-Wyoming border. It had an economy based primarily on bison hunting and made extensive use of trapping mechanisms. There also appears to have been a selection for specific, diagnostic lithic materials, projectile point, and biface styles and ceramics. (Adams 1977:139-140)

Morgan. Morgan (1979:220), on the basis of ceramics recovered from the Garratt site in Saskatchewan, postulated that Avonlea represents a displacement and movement of populations from the Upper Mississippi Valley into the Northwestern Plains during A.D. 150-200. By about A.D. 600, it appears to have displaced Besant geographically in many areas of the Northern Plains, particularly in Canada.

Klimko. It was originally believed that Avonlea was concentrated on the grasslands of southern Saskatchewan, Alberta, and northern Manitoba but recent data have extended the distribution of Avonlea northward, westward, and southward (Klimko 1985:67). Overall, Klimko (1985:70) argued that the temporal and spatial distribution of Avonlea sites tend to suggest a northward and westward expansion or movement from an east or southeastern loci as was hypothesized by Morgan (1979). Klimko (1985:77) suggested that the

presence of Avonlea sites in the mixed-wood forest can be interpreted as seasonal excursions into the area and reflects the flexibility of the Avonlea peoples in their ecological and socio-cultural adaptations.

Brumley and Dau. Brumley and Dau (1988:44) saw problems with Reeves' Avonlea and Pelican Lake Phase model regarding lithic utilization. Avon chert, Madison Formation cherts, Fort Union Formation porcellanite, and obsidian are used extensively in sites with convex-based Pelican Lake points within southern Alberta, southern Saskatchewan, and northern Montana. But during the Avonlea Phase, there is essentially a total absence of these lithics being used in the same areas. If there was a simple technological change, as Reeves suggested, between Pelican Lake and Avonlea Phases, Brumley and Dau (1988:44) argued that one would expect continuity in lithic utilization patterns. They proposed that differences between convex-based and straight-based Pelican Lake points reflect significant cultural differences and suggested that sites with straight-based Pelican Lake points, located in a core area of southeastern Alberta, south-central Saskatchewan, and northern Montana, developed into the Avonlea Phase around 0-200 A.D.. This came about with the integration of the bow and arrow into the subsistence technology and then Avonlea Phase peoples expanded southward and westward, displacing Pelican Lake groups with convex-based projectile

points as far south as the Missouri (Brumley and Dau 1988:44-45).

Brumley and Dau (1988:46) further extended their model by suggesting that the lower frequency of Avonlea Phase sites as observed by Vickers (1986) and Dyck (1983) supports the idea of a different social structure for Avonlea Phase peoples which may in turn be reflected in their subsistence and settlement cycle. Brumley and Dau's settlement model for southeastern Alberta proposes that open, level to strongly rolling prairie areas far from major river valleys were used mainly during spring and early summer by both man and bison because of the availability of surface water at that time. However, the Ramillies site and EcOs-41, two exceptions to this model, suggest that Avonlea peoples did not disperse to the extent or as frequently as other cultural groups (Brumley and Dau 1988:46). Avonlea populations may have been as large as earlier and later cultural groups, but with different settlement systems resulting in fewer overall numbers of sites and those being larger in size(Ibid.).

Brumley and Dau (1988:47-48) also postulated the questionable idea that Avonlea peoples attempted to secret their technology of the bow and arrow, delaying its acquisition by neighbouring groups thus allowing them to expand territorially. According to Brumley and Dau (1988), bow and arrow manufacturing and use was integrated into Avonlea spiritual and shamanistic

practices and in this way, it was socially regulated. But, by mid- to late Avonlea times, neighbouring groups began to acquire and utilize the bow and arrow technology, at first not as successfully as Avonlea peoples, as reflected in lower quality of workmanship and variation in styles seen within later or "degenerate" Avonlea assemblages (Brumley and Dau 1988:48). However, these authors made no mention of what happened to the "classic" Avonlea peoples at this time; were they absorbed by the other neighbouring groups and disappeared, or did they continue on? Also, one must wonder who exactly were these neighbouring groups. It is difficult to imagine that this so-called "social regulation" of the bow and arrow could be responsible for keeping bow and arrow technology from other populations for so long. Indeed, it would seem logical to assume that a group would adopt or attempt to adopt the bow and arrow as soon as they saw it utilized by Avonlea peoples during hunting or even warfare against themselves. It would probably be extremely difficult to hide such a technology from others when used commonly for hunting and fighting. Brumley and Dau (1988) offer little evidence to support the idea that the bow and arrow was integrated into the spiritual world of the Avonlea peoples. A scenario such as this one is highly controversial, impossible to prove archaeologically, and carries so many different implications leading to varied interpretations. Furthermore, this type

of conjecture again reflects the pre-eminence of projectile points in Plains archaeological interpretations. In effect, we are creating projectile point peoples, most probably distorting actual prehistoric lifeways. Possibly, projectile points were a very minor part of the total culture, while other perishable items played a more important role in ritual and religious ceremonies.

Summary

In summary, although Wilcox (1988) argued that current anthropological data supports the plausibility of the Avonlea Phase representing an Athapaskan migration, Kehoe's theory is dismissed by most Plains archaeologists because of its speculative nature based on reconstruction of language patterns and the lack of earlier dated Avonlea Phase sites in the north. Brumley and Dau's (1988) model must be considered highly contentious as well as ambiguous and unsupported by archaeological data. There appears to be some support for both the eastern origin hypothesis of Morgan (1979) and the in situ development scenario of Avonlea (Reeves 1983a). Most archaeologists, however, favour Reeves' hypothesis that the Avonlea Phase developed out of the Pelican Lake Phase due to the acquisition of the bow and arrow and ceramics (Table 22). Because the

| | Kehoe 1966; Kehoe & Kehoe 1968 | Reeves 1983a (1970) | Byrne 1973 |
|---|---|---|---|
| Origins of Old Women's Phase | The earlier Prairie Side-Notched tradition of the Old Women's Phase is associated with Algonkian peoples derived from earlier Besant traditions of Sask. Middle Woodland period. The later Plains Side-Notched tradition is the result of a population movement of Missouri Village tribes of the Mississippian cultural tradition expanding up the Plains Rivers. | The Besant tradition (Napikwan) gradually dominated over Avonlea and by A.D. 750 evolved into early Prairie Side-Notched tradition of the Old Women's Phase and then further developed into the late Plains Side-Notched tradition influenced partially by Avonlea. | Based on ceramics, concludes that Old Women's Phase most likely is developmentally linked to the preceeding Avonlea Phase. |
| Origins of Avonlea Phase | Population migration of Athabascans from the northern Canadian Boreal forest who brought with them the Avonlea point and tool kit, displacing Besant peoples. | Developed out of the preceding Pelican Lake phase as a result of diffusion of the bow and arrow from interior B.C. and ceramics from the east. Avonlea and the intrusive Besant then co-existed on the Plains till A.D. 700. | Agrees with Reeves (1983) that Avonlea developed locally out of Pelican Lake Phase due to the acquisition of the bow and arrow from the west and ceramics from the east. |

Table 22. Major Theories Regarding Avonlea and Old Women's Origins

| | Morgan 1979 | Adams 1977 | Brumley & Dau 1988 |
|---|---|---|---|
| Origins of Old Women's Phase | Argues that based on pottery from the Garratt Site that Avonlea and Old Women's ceramics do not represent a single cultural development as suggested by Byrne (1973). | Sees the Avonlea Phase as either outlasting or assimilating the Besant Phase to form the basis of the Old Women's Phase. | Argue for 3 transitions:<br>1. In s. Alberta, Sask. and n. Montana, transition from Avonlea to Prairie/Plains.<br>2. In s. central Sask. to NE Montana and west Dakotas, transition from Besant to Prairie/Plains.<br>3. In central and s. Montana, transition from convex-based Pelican Lake to Prairie/Plains. |
| Origins of Avonlea Phase | Sees Avonlea as representing a displacement and movement of populations from the Upper Mississippi Valley into the NW Plains during A.D. 150-200. | Also supports Reeves' hypothesis that Avonlea developed from the Pelican Lake phase due to the introduction of the bow and arrow from the west and pottery from the east. | Argue that straight-based Pelican Lake tradition located in a core area of se. Alberta, s. central Sask., and n. Montana, developed into Avonlea around A.D. 0-200 with the integration of the bow and arrow; then expanded south and west to displace convex-based Pelican Lake groups as far south as the Missouri. |

Table 22 (cont'd). Major Theories Regarding Avonlea and Old Women's Origins

| | Duke 1981 | Vickers 1986 |
|---|---|---|
| Origins of Old Women's Phase | Increasing precipitation levels of the sub-Atlantic period resulted in increased carrying capacity of the land allowing Besant peoples to expand into the Plains. As trophic levels dropped, Besant and Avonlea phases amalgamated resulting in the emergence of Old Women's Phase. | Sees a possible scenario of Prairie Side-Notched points deriving from Besant-Samantha points while Plains Side-Notched points derive from Avonlea points. |
| Origins of Avonlea Phase | — | — |

Table 22 (cont'd). Major Theories Regarding Avonlea and Old Women's Origins

major concern of this study is the determination of the relationship between Avonlea and Old Women's Phases, the relationship between Pelican Lake and Avonlea has not been dealt with in any great detail. Based on a cursory examination of the presently available archaeological evidence, it appears that Reeves' model, which sees the Avonlea Phase developing out of the Pelican Lake Phase, is the most plausible. Although radiocarbon dates indicate slightly earlier dates for Avonlea Phase sites in the east and south, I believe Morgan's (1979) and Klimko's (1985) hypothesis is still very speculative. Obviously a detailed analysis, in addition to new evidence, is needed to shed light on this issue.

## THE OLD WOMEN'S PHASE

### Early Views of the Old Women's Phase

Forbis (1962) was the first to extensively discuss the typology and seriation of the small side-notched point styles from Old Women's Buffalo Jump. Then in 1966, Kehoe (1966:827-841) expanded and categorized all small side-notched points of the Northern Plains into three types: Avonlea, Prairie Side-Notched, and Plains Side-Notched. For the Prairie and Plains Side-Notched, he recognized fourteen varieties (Figure 17). Avonlea points

have already been discussed. To briefly reiterate, the Prairie Side-Notched are characterized by poor quality flaking, lack of symmetry, rough areas and hinge fractures. Notches are large, wide, shallow, V to U-shaped, and placed low on the blade. The point itself is irregular in outline (Kehoe 1966:830). Varieties include Swift Current Fish-Tail, Irvine, Shaunavon Truncated-base, Lewis, Thompkins Side/Corner Notched, and Nanton (Kehoe 1966:831).

Plains Side-Notched points are well defined in outline, with symmetrical, well executed flaking. Notches are small, deep, narrow, acute, U-shaped, and placed high on the blade (Kehoe 1966:832). Varieties include Paskapoo, Pekisko, Emigrant Basal-notched, Billings Double-Spur Basal-Notched, Buffalo Gap Single-Spur, Cut Bank Jaw notched, and Washita.

As suggested by Kehoe's and Forbis' typologies, the Old Women's Phase includes an extremely broad range of point styles and cultural materials which are found throughout southern Alberta, Saskatchewan, and northern Montana. It must be remembered that this broad category of the Prairie/Plains Side-Notched complex does not infer cultural homogeneity, but rather reflects our present inability to segregate these Old Women's Phase points into "culturally meaningful units" (Brumley and Dau 1988:49). As suggested by Forbis' and Kehoe's studies of Old Women's points, it is highly

probable that these different types of Old Women's points have temporal significance, however, their regional and cultural significance, if any, is yet to be understood.

Theories Regarding Origins of Old Women's

Kehoe. Kehoe (1966:839) argued that the source of all the Avonlea, Prairie and Plains Side-Notched point traditions lies outside the Northern Plains. According to him (1966:839), the Avonlea Phase, as previously mentioned, is correlated with migrations of Athabascans onto the Plains. Prairie Side-Notched points, appearing around A.D. 700 are associated with Algonkian peoples and are possibly derived from earlier Besant points of the Middle Woodland period in Saskatchewan. These Prairie points decline in frequency around A.D. 1300. Plains Side-Notched points, on the other hand, come onto the Northern Plains from the southeast, and supposedly belonged to the Mississippian cultural tradition and were carried by Missouri Village tribes as they expanded up the plains rivers. These points appear around A.D. 1300-1500 on the Northern Plains and extend into the historic period (Kehoe 1966:839). Kehoe's conclusions imply that Plains inhabitants were uninventive, static, non-changing peoples in that he argued for the source of all three traditions lying outside the plains.

Reeves. As mentioned previously, Reeves (1983a) argued that Besant and Avonlea Phases co-existed for over 500 years on the Northwestern Plains. Then, around A.D. 700-800, according to Reeves' original version (1970), the Napikwan tradition Besant began to dominate in the Saskatchewan Basin, eventually replacing the Tunaxa tradition Avonlea peoples entirely; the Napikwan Besant populations then evolved into early Prairie Side-Notched traditions of the Old Women's Phase (Reeves 1983a:47). There are, however, problems with Reeves' model. Why did the Besant and Avonlea Phase peoples co-exist as separate traditions for over 500 years and then Besant suddenly abandon the atlatl and adopted the bow and arrow and pottery technology from Avonlea peoples? Reeves provided no explanations as to why these traditions co-existed for so long before Besant's domination over Avonlea. Byrne (1973:468) noted that Reeves' proposals of Besant suddenly taking on pottery and the bow and arrow, seem unlikely.

Reeves later argued in an updated preface of the published version of his dissertation (1983a:20), that the early Old Women's Phase was derived from Besant and then developed into a late Old Women's Phase partially influenced by Avonlea. His revised model therefore suggests that the Avonlea Phase is strongly linked technologically to the late Old Women's

Phase, antecedents to which lie in the early Old Women's Phase and Besant traditions within the Northwestern Plains region.

Byrne. Byrne's (1973:469) studies at the Morkin site in southwestern Alberta indicated that side-notched points of the Old Women's Phase probably were an outgrowth of Avonlea Phase projectile points rather than Besant or Samantha points (small Besant points found in late Besant occupations). Statistical studies of projectile point metrics revealed a higher degree of correlation between Avonlea and Old Women's Side-Notched points than between Besant and Old Women's points (Byrne 1973:468). In reviewing site collections from southern Alberta, Byrne (1973:446) found no single instance of indisputable association between pottery and Besant. Although there is no evidence of pottery with the Besant Phase, according to Byrne, a great deal appears in both Avonlea and Old Women's assemblages in southern Alberta sites. This led Byrne (1973:470) to suggest that either the Avonlea Phase replaced the Besant Phase in the Saskatchewan Basin, not vice versa as Reeves (1983a) concluded in his earlier model; or there was a merging of both the Avonlea and Besant Phases to form the basis of the Old Women's Phase. Ceramic evidence does in fact support a developmental linkage between Avonlea and Old Women's ceramics. As Byrne stated:

> ... the shift from Early to Late Variant in the Saskatchewan Basin complex would seem to reflect not a sudden replacement of the local population, but rather a gradual modification of local cultures as a consequence of cultural stimuli from the east plus internal development. (Byrne 1973:469-470)

Byrne (1973:470), therefore concluded that:

> ... the Old Women's phase most likely represents a development involving the borrowing of at least bow and arrow technology and pottery making from the Avonlea phase, but it remains to be seen just how much of a contribution the Besant phase made to this new cultural entity.

Stratigraphic mixing at the Morkin site should have influenced Byrne's conclusions although he chose to analyze the data as if the cultural components were unmixed (Byrne 1973:12-26). Possible mixing of assemblages could create a situation that appears to resemble a gradual change in ceramics rather than what might have been a distinct break in artifact types, as Syms (1977) pointed out. In addition, Morgan (1979:227) argued that her studies at the Garratt site offered no evidence to support Byrne's (1973) conclusion that the Avonlea Phase and the late side-notched tradition ceramics represent a single cultural development. However, because so many other sites indicate a continuity of development between

the Avonlea Phase and the Old Women's Phase, Byrne's interpretations may not have been incorrect.

Adams. Adams' (1977:142) saw great continuity between Avonlea and Old Women's and concluded that Avonlea either outlasted or assimilated the Besant Phase and that the Tunaxa tradition was responsible for the development and proliferation of Old Women's Phase. Adams (1977) based this on studies at the Estuary Bison pound site where two cultural levels were discovered. Level II included Avonlea Phase traits and Old Women's Phase points and was dated at A.D. 770±165 (Adams 1977:141). Level I contained artifacts present in Level II but lacked Avonlea points, and was dated at A.D. 740±80 and A.D. 890±70 (Adams 1977:142).

Duke. Duke (1988:266), in discussing models for documenting change in the Late Prehistoric period, limited his analyses to points and ceramics, not because they are the only important elements but because they have been the most intensively described and the best known. With regards to projectile points, Duke (1988) analyzed Late Prehistoric points from several Alberta sites based on three levels of analysis: lithic source, knapping configuration, and formal metric and non-metric dimensions.

Concerning lithic sources, Alberta Avonlea Phase sites show a preference for local materials with some use of Montana and foothills sources

while Besant reveals a high incidence of KRF, and Old Women's points are made primarily from local materials (Duke 1988:267). Analysis of knapping configuration indicates Avonlea's fine lithic craftmanship in sharp contrast to the irregular flaking of Besant, while Old Women's points show a trend towards improved flaking through time (Duke 1988:268). A study of dimensions reveals Avonlea type points are much closer in size to Old Women's points than to Besant; however, the earliest type of Old Women's points (Irvine and Nanton) are difficult to distinguish from the Samantha Side-Notched form of the late Besant Phase.

On the basis of this analysis, Duke (1988:268) concluded firstly, that Old Women's points morphologically developed out of preceding Besant forms as suggested by the similarities of flaking and similarities between Old Women's types and the Samantha forms; and secondly, that the change was caused by the adoption of arrow technology and a concomitant reduction in overall point size. To him, the pottery suggested a development from Avonlea to Old Women's; this follows Byrne's (1973) conclusion of a simple linear development between Early and Late Variant forms of the Saskatchewan Basin complex.

Duke (1981,1988) hypothesized that the Avonlea and Besant Phases amalgamated to form a new phase, that of the Old Women's, and furthermore,

that climate played a primary role in these changes. Bryson and Wendland (1967) and Bryson and others (1970) have outlined Late Holocene climatic episodes for the northern Plains. During the sub-Atlantic period (2450-1550 B.P.), the Plains area experienced an increase in precipitation which in turn increased the potential for biota and human populations. Besant populations were thus able to invade the Plains and co-exist with the indigenous Avonlea peoples. With the onset of the Scandic period (1550-1050 B.P.) with decreasing precipitation and increasing temperatures, biota levels dropped resulting in lowered bison availability and severe human readaptations. Closer contact was required between Avonlea and Besant populations for joint hunting expeditions and the sharing of information about resources. This resulted in elements of both Avonlea and Besant populations being forced to integrate and form the basis of the Old Women's Phase (Duke 1981,1988).

Two major problems exist with Duke's scenario. Firstly, his conclusions are based only on point and ceramic types, which represent only two elements in a cultural system; moreover, they may be very minor ones. He did not deal with data on subsistence and settlement patterns, resource utilization, the range of lithic sources used in other stone tool production besides point manufacturing, and the features and stone tools associated

with specific activities. Secondly, he is somewhat deterministic when assuming that climatic change is the single factor leading to cultural change. While it is possible that climatic change did play a role in Late Prehistoric culture change, it is most likely that complex interaction of multiple factors were involved.

Morlan. Morlan ('988) also suggested the possibility of a relationship between these phases and climatic change. Based on a review of Avonlea, Besant, and Old Women's radiocarbon dates, Morlan (1988:307) argued that Besant could not have replaced Avonlea because Avonlea persisted well after the disappearance of Besant in the Northern Plains. Therefore, Morlan (1988:307) suggested a possible "waning of the Napikwan tradition and waxing of the Tunaxa" with the early Prairie points (more similar to Besant points) and later Plains points ( more similar to Avonlea points). The co-occurrence of these forms (Avonlea and Besant) could be considered possible evidence of acculturation between these two traditions (Napikwan and Tunaxa), with both contributing to the formation of the Old Women's Phase. Morlan (1988:307) further suggested that Avonlea may represent a highly successful adjustment to the Scandic episode at the eventual expense of the Besant populations.

Vickers. Vickers (1986:100) suggested that one could argue that small

side-notched points were derived from the Besant-Samantha line because of the similarity of Irvine, Nanton (early Old Women's point types), and Samantha (Besant) points. He hypothesized (Vickers 1986:99) a Nanton\Irvine- Besant linkage partly based on the presence of Nanton points in association with the Lower Member at Old Women's Jump and partly on Reeves' (1983a:63) discussion of Besant points called Samantha side-notched which are very similar to Forbis' (1962) Irvine type and certain Nanton forms. Furthermore, he suggested that one could argue that the Prairie Side-Notched group (Nanton, Irvine, Lewis, and High River points) was derived from Besant-Samantha and the Plains Side-Notched group (Washita, Pekisko, and Paskapoo) was derived from Avonlea. This would not be inconsistent with radiocarbon dates of the three phases (Vickers 1986:100).

Brumley and Dau. Traditionally, Old Women's culture is seen as developing out of Avonlea culture as suggested by several sites where Avonlea and Old Women's points are found together representing a possible "transitional" stage. However, data from single component Old Women's sites exhibit radiocarbon dates that are comtemporary with mid-Avonlea times (Brumley and Dau 1988:49). Dyck (1983:110-111) had noted that radiocarbon dates for Saskatchewan indicate contemporaneity of Avonlea

materials first with Besant and then with Prairie Side-Notched points. Brumley and Dau (1988), therefore, proposed three different sequences leading to Prairie/Plains side-notched varieties: (1) in southern Alberta, southern Saskatchewan, and northern Montana, there was a transition from Avonlea to Prairie/Plains; (2) in south-central Saskatchewan to northeastern Montana, and the western Dakotas, there was a transition from Besant to Prairie/Plains; and (3) in central and southern Montana there was a transition from convex-based Pelican Lake to Prairie/Plains.

Brumley and Dau (1988:51) disagreed with Reeves' (1983a); Old Women's did not develop out of both Avonlea and Besant but developed directly out of Avonlea in southern Alberta, while Besant developed into other Prairie/Plains complexes in areas outside of Alberta. Their hypothesis still does not account for the overlap in age of Prairie and Avonlea and Besant in southern Saskatchewan and Alberta. Brumley and Dau's scheme is vague, and perhaps too broad and generalized, without specific archaeological evidence to support their hypothesis.

Summary

In summary, as with Avonlea, there are conflicting interpretations concerning the origins of the Old Women's Phase. For example, both Byrne

(1973) and Adams (1977) argued for the Old Women's Phase developing out of the Avonlea Phase; Reeves (1983a), on the other hand, believed that the Old Women's Phase originated from Besant with influence from Avonlea; and Duke (1981) argued for an amalgamation of both Besant and Avonlea Phases which formed the basis for the emergence of the Old Women's Phase; while Brumley and Dau (1988) saw the Avonlea Phase developing directly into the Old Women's Phase only in southern Alberta and Saskatchewan (Table 22).

# CHAPTER FIVE

# CONCLUSIONS

## INTRODUCTION

The aim of this thesis was to determine the relationship between the Avonlea and Old Women's Phases of the Late Prehistoric Period on the Northwestern Plains, and evaluate it in terms of culture change. A detailed and critical review of the concept of culture change and methods for studying it, revealed a need for an alternative method that is both more informative and critical, for analyzing and identifying culture change in Plains Prehistory. It is hoped that this thesis will provide the basis for studying change not only during the Late Prehistoric Period, but also extending to other time periods of Plains Prehistory.

## AVONLEA AND OLD WOMEN'S PHASES

The evidence from Avonlea sites, Old Women's sites, and multi-occupation sites presented in this thesis, suggests that resource utilization, lithic technology, lithic raw material choice, and ceramic production changed very little from the Avonlea Phase to the Old Women's Phase, the

only distinct and obvious changes being in projectile point form and stylistic variation in ceramic decoration. Therefore, it is reasonable to conclude that no major culture change involving completely new cultural or ethnic groups occurred from one phase to the other. It is unfortunate that the existing definition for the Avonlea/Old Women's boundary is based primarily on change in projectile point form, because this can lead to the assumption that there was an accompanying change in ethnicity or cultural group.

## CONCLUSIONS

Based on the archaeological database of lithic use and technology, ceramics, lithic tool types, and radiocarbon dates presented in chapters two and three, my proposed model to describe the Avonlea/Old Women's relationship is one of interaction between Besant and Avonlea Phase populations to eventually form the basis of the Old Women's Phase. People using Besant type points entered the Plains and came in contact with indigenous populations using Avonlea type points. Contact, diffusion, and exchange between populations eventually resulted in gradual changes in projectile point morphology to Prairie Side-Notched type points in some groups. Further population increases and culture contact between groups

using Avonlea type points, groups using Prairie type points, and groups using both point types eventually led to changes in point style to Plains Side-Notched varieties. It must be emphasized that it was the point styles, and not the people or cultural groups that were undergoing these changes.

The similarity exhibited between Avonlea and Old Women's Phase lithic and ceramic assemblages and the overlapping radiocarbon dates indicate a continuity between the two phases and appears to support this model. The next step in this investigation would be to examine and analyze in detail other parts and aspects of Late Prehistoric assemblages to determine if this continuity also extends to faunal data, climatic and environmental data, subsistence/settlement pattern data, seasonal round data, activities and feature data, and burial pattern data. These analyses, as well as new data and sites dating to the Late Prehistoric, may shed more light on this issue, either supporting or challenging the proposed model.

Several mechanisms can be suggested to explain this change or "amalgamation" of Besant and Avonlea populations. Culture contact through communal hunting activities and intermarriage, and increasing population may have resulted in small localized population groups producing variations and changes in projectile point form. It is often assumed that a distinct projectile point style was used to demarcate and maintain a group's

boundary. We must remember, however, that there were numerous other culture material items that were more likely used for group identification, such as organic items that have not survived in the archaeological record.

Why else would projectile point forms change if not for stylistic reasons or group identification? A common explanation for form variation is function, but normally archaeologists assume that the game-killing function of projectile points remained constant. Other functional considerations that could result in changing point form include: use of raw materials with radically different flaking characteristics which might lead to the production of new point forms; perhaps a specific point form proved to be more efficient in killing game or that it could be better hafted to a shaft; possibly different points were more efficient for killing different types of game animals and at different seasons; and lastly, the shooting distance between hunter and game may have had an effect on point form and size. Future research should deal with these functional considerations, as possible causes of variability. The variability being discovered between Avonlea and Old Women's Phase assemblages may be, in fact, monitoring a complexity of factors: stylistic variation, boundary maintenance, functional considerations, and individual artisan variability. Obviously there is a need for a more explicit theoretical framework for examining variability in the archaeological record and its causes.

Several other problems and conclusions have been identified during this study. Plains archaeologists tend to make sweeping generalized statements with little, if any, data to support them. These statements become unquestioned theories or models which are then used by other archaeologists without critical evaluation or skepticism. Opinions are often presented as facts. Attempts are made to force new data to fit these unquestioned models. Many of the reconstructions reviewed in chapter four dealing with the relationship between the Avonlea and Old Women's Phases, lack a solid scientific basis, and are often based on one type of evidence or the evidence from only one site.

This pattern could relate to the lack of comparable data in Plains archaeology. Clearly, there is need for a more universal, consistent, and rigorous typological system with regards to lithic raw materials and tool types. The differences in lithic categorization and terminology and tool typologies in Plains archaeology make comparative analysis of sites extremely difficult. Furthermore, inconsistencies and differences in reporting content and format of data presentation between site reports also hampers comparison and does not allow for a scientific basis in testing archaeological hypotheses. There is a definite need for both a more uniform typological and data presentation system in Plains prehistory. The data is available but not in a form which

permits comparison.

Plains archaeologists continue to operate in a typological mode. They concentrate on identifying and classifying the types of points and tools found in archaeological assemblages and in the process, say nothing about culture and human behaviour. Furthermore, archaeologists have gone so far as to use the shape and style of projectile points to determine the presence, distribution, and demise of prehistoric cultures. They are equating projectile points with culture. This practice is often extended to phases. As Wormington and Forbis (1985:278) noted, because projectile points are the main identifying criteria for phases, the phase has often been reified into an ethnic group. But it must be remembered that phases, as well as projectile point typologies, are heuristic devices only, imposed on archaeological data for organizational purposes. They do not represent some sort of past sociocultural reality. Using the concept of the phase or type is useful to organize and simplify our archaeological data, but we cannot allow ourselves to assume a one to one relationship between phase or point type and cultural group.

Cultural groups, no doubt, throughout prehistory, moved on and off the Plains (Oliver 1974). But because of the uniformity of the environment and similar adaptations to Plains conditions, it has been difficult to identify

separate cultural groups except by using changes in projectile point form as these are the most highly visible traits in the archaeological record. Defining at what point one culture ceases to be, and a new one emerges is difficult and no doubt arbitrary and should not be based solely on projectile point changes. When studying the pattern of change over time, archaeologists must attempt to deal with more than just point types; culture change should be evaluated within the context of all available archaeological information. Prehistory on the Plains is much more a continuum than a sequence of separate stages or phases (Michlovic 1986).

An issue relating to this, and briefly mentioned in this thesis involves the great diversity of Old Women's point types. If one assumes that these points do have temporal, regional and cultural significance and possibly correspond to different bands, we once again fall into the trap of equating projectile points with a particular group of people. If perhaps, though, these diverse point types do have some type of "regional" significance, it would be logical to conclude firstly, that bison kill sites, where groups of people came together to conduct communal hunting, would contain the greatest variety of Old Women's points; and secondly, that small campsites would most likely have a more limited number of Old Women's varieties. With the relatively low sample of Old Women's sites discussed in this thesis, this hypothesis cannot be

adequately tested. One problem, though, is that many archaeologists do not utilize Forbis' complex scheme for typing Old Women's points, but rather simply classify the points as either Prairie or Plains Side-Notched. Furthermore, one can raise questions relating to the typology itself. Is the typology measuring valid variations or is it simply a situation of "splitters" versus "lumpers"? Future studies could analyze in detail these apparent multiple Old Women's Phase point types to determine the actual significance, if any, of the varieties.

Because Plains archaeologists are often caught by the fallacy of equating material remains to a cultural group, they tend to forget about human behaviour and process. Material items recovered from an archaeological site are not equivalent to the cultural group but rather the result of human behaviour. As archaeologists we are required to translate the static archaeological record into dynamic, cultural human behaviour in order to begin to understand cultural process and change. When studying change, we must not get too caught up in concentrating on the materialistic aspects of culture and fall into the trap of equating projectile points and phases with cultural or ethnic groups. We should not forget the human element and aspects of change.

> ... archaeology is ultimately concerned with people and, therefore, must contend with all the human vagaries so clearly reflected in the historic and ethnological documents as well as in present day societies. To do otherwise would relegate the discipline to a mechanistic exercise which, however, satisfying to some personalities, would forfeit the most important contributions archaeology can make. (Wright 1977:2)

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